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PIPE-LAYING BY STEAM SHOVEL

Trench Dug and Pipe Handled and Lowered into it by Steam Shovel, Which Also Lays its Own Platform, Pulls Up Trees and Performs Other Services—Details of Work and Cost.

With the cost of labor so high and with laborers difficult to get and still more so to keep, many contractors have been forced to adopt labor-saving devices, and to substitute machinery for hand labor to do the work with fewer men. An unusual example of ingenuity on the part of the contractor in adapting machinery on hand to conditions is to be found in a job near Perth Amboy, N. J., which involves the laying of about 18,000 feet of 30-inch cast iron force main, furnished by the Warren Foundry & Machine Co.

Several problems were involved. There were no ways of transporting any large force of men to and from the work, men were exceedingly hard to get and the high cost of labor threatened to devour all possible profits and more. The contract was awarded rather late in the season and, though no especial difficulties in construction presented themselves, a large force of men would have been required to complete the work this season. All sorts of excavation and hauling were to be found, as the line ran alongside road, in roads, through woods, fields, etc., and it was necessary in a few places to remove trees and underbrush before digging the trench. The pipe had to be unloaded from cars and hauled an average distance of a little less than two miles.

Among the equipment owned by the contractors, Graham & McKeon, of Perth Amboy, N. J., were three steam shovels. Some of these had already been employed in sewer trench excavation and sewer construction, and the contractors determined to attempt to excavate the trench for the pipe by use of one of them. A dipper arm, 26 feet long, was secured and placed on a late model Type O Thew shovel, this length of arm allowing excavation to a depth of more than six feet, which was that to which the trench was to be excavated. Timbers, 12 inches square and 26 feet long (20 feet would have been long enough), were bolted together in threes, and a floor of these, laid perpendicular to and across the trench line, supported the shovel. In the center of each bunch of three timbers was fastened a ring. By means of a chain connecting this ring to the dipper arm, the floor

sections were raised by the steam shovel, swung in front of the shovel, and placed spanning the trench to furnish a flooring on which the shovel could move ahead. Practically no hand work was necessary, the men merely guiding the beams to place. Two sections, or six feet of the floor, were usually placed and the shovel then moved forward six feet. At every other forward movement of the shovel, a 12-foot section of the pipe was laid. This lessened the time lost in work other than excavation and allowed a systematic procedure.

The materials encountered in excavation varied. For a long distance the excavation was in hard clay, which

came out in chunks. Following this, sand was found while digging alongside and, later still, directly in a road. For a short section the line was through a forest. Where thick brush or many trees were encountered, the line had to be cleared. Small brush was disregarded by the shovel and isolated trees up to 8 or 9 inches in diameter were either pulled up bodily by the roots by the shovel or undermined by it and tipped to one side out of the way. By means of a chain fastened around the trees, the shovel could remove those up to 6 inches in diameter by direct pulling. The time lost in these operations and in pulling up fence posts, etc., which were in the



LOWERING PIPE INTO TRENCH.

way was small and the cost was not as great as by hand operations. In all kinds of excavation, the shovel cut a clean trench with vertical sides, about 4 feet wide and 5½ feet deep. In the illustration, which is from a photograph taken while the shovel was in sand excavation, the vertical walls may be seen clearly. Two teeth with chisel-like edges placed on the sides of the bucket aided in cutting the sides to a true surface. These additional teeth may be noted in the illustrations.

The shovel carried the excavated material through an arc about 135 to 160 degrees and dumped it in position convenient for back-filling. In sandy soil, which was favorable for rapid work, the shovel made an average of three bucketsful per minute. With a half-yard bucket, a full load was obtained at every stroke of the shovel, and the rate of excavation while the shovel was work-



STEAM SHOVEL HANDLING PIPE.

ing was about $1\frac{1}{2}$ yards per minute, or nearly 2 linear feet per minute. Traffic and other obstructions prevented continuous work.

As the trench was excavated, the supporting platform was moved ahead and at 12-foot intervals a section of the pipe was laid. In laying the pipe, one end of a chain was placed around the center of a length and the other end attached to the shovel arm, and the shovel thus swung the pipe around and lowered it into the trench. Though the weight of a section was approximately two tons, it was handled easily by the shovel and, guided by two men, was entered and held in place until sufficient fill had been placed to hold it firmly. About three minutes was the usual time required to lay a length. Bell holes were cut by two men, who did no other work.

To operate the shovel and assist in excavating the trench and laying the pipe, only seven men were required, including a foreman. An engineer and a fireman operated the shovel; two shovelmen were occupied in cutting bell-holes, and two others assisted the shovel in

laying the pipe and moving forward the platform; the work of the last named including guiding the pipe and platform timbers while being placed by the shovel, preparing the ground for the platform, helping clear the right of way, etc.

An average day's work for the crew of seven men and the shovel was 250 feet of trench dug and pipe laid. The approximate cost of maintaining this gang was \$23.30 for wages (the men were paid \$2.70 and up per day), and \$15.50 per day for shovel operation; this amount including fuel, interest, moving charges, and depreciation on the shovel, based on interest at 6 per cent, depreciation at 10 per cent per year, and repairs at 3 per cent per month, based on an operating season of six months of 22 days each. This total cost of \$38.80 per day is equivalent to a cost for trenching and laying of 15.5 cents a foot, counting 250 feet of work done per day.

Another labor-saving device was employed to calk the mains and this further reduced the number of men necessary for the prompt completion of the work. Where ordinarily six men, including a man to tend the furnace, would be employed in calking, two men and a helper did the work. A Chris D. Schramm pneumatic calker was used, and by its use the reduced force easily calked 25 joints per day. The calker consisted of a 5-6 h. p. gasoline engine, a small air compressor and a calking head connected to the same by an air hose. One man was required to care for the machine and lead kettle, carry lead, etc., while the other two men did the actual work in connection with the calking.

As the excavated soil was, for the most part, easy to handle, a team and two men were able to backfill at about the same rate as that at which the pipe was laid. With the team and driver charged at the rate of \$6 per day and the extra man at \$2.70, the cost for backfilling was approximately $3\frac{1}{2}$ cents per foot of pipe line.

The pipe was shipped in cars, each car containing ten lengths of pipe. To unload the pipe, the contractors

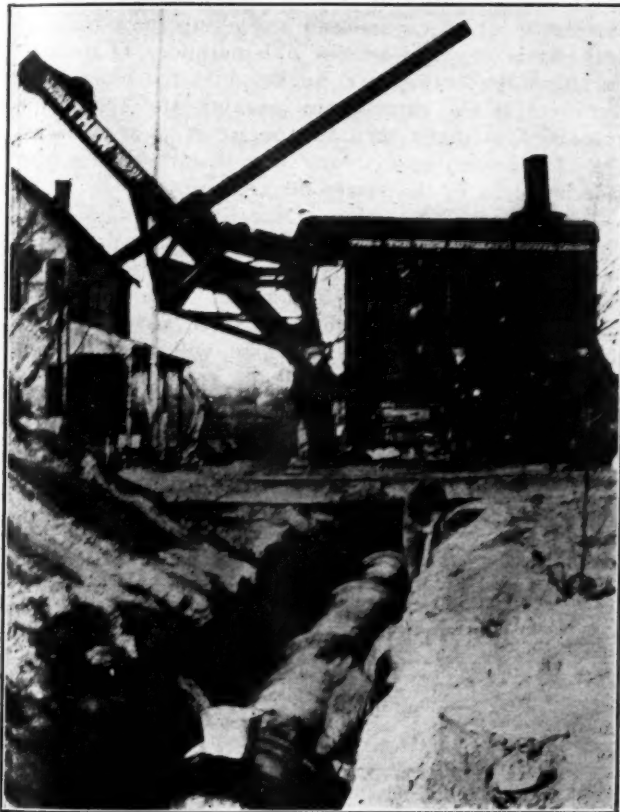


SHOWS NATURE OF SOIL AND DEPTH OF TRENCH.



SHOWS PERPENDICULAR TRENCH WALLS.

devised a small derrick, by means of which one man, assisted by the driver of the loading team, was able to handle the pipe. This consisted of a 10-inch I-beam about 18 feet long, the ends supported on A-frames made of 6-inch channels. On the lower flange of the I-beam as a track, ran a little trolley, much the same as those used in butcher shops. The derrick was so set that this beam spanned the car and the position occupied by the wagon while being loaded, so that the pipe could be lifted from the car by chain blocks attached to the trolley, run to position over the wagon and lowered onto it. By use of this contrivance, 35 or 40 lengths could be unloaded in a day by one man aided by the drivers, and with 7 or 8 teams this number could be hauled to the pipe line in one day. With teams at \$6 and a haul of somewhat less than two miles, the cost was slightly less than 11 cts. per foot for unloading, hauling and delivery; but as the teams belonged to the contractor the actual cost was not so high.



PIPE LAID, READY FOR CALKING.

MOTOR FIRE APPARATUS IN SYRACUSE.

The Bureau of Fire of Syracuse, New York, calculates that for each horse supplanted by motor apparatus the city saves about \$185 a year. There are still more than fifty horses employed in the service, and the average cost per year of these is calculated to be \$250, this covering not only food, but shoeing, harness repairs, and all other items connected with the use of the horse.

In comparing the cost of horse-drawn with that of motor apparatus, it ordinarily is not fair to the latter to use in the comparison the figures for the first year of operation, since during that year the apparatus is used by members of the force for the purpose of learning to operate it, and in this way probably fully as much gasoline and oil are used as when actually running to a fire. One of the Syracuse engine companies consumes in actual service an average of 48 gallons of gasoline a month,

giving a cost of \$144 a year; to which should be added \$60 for oil and other materials, making a total of \$204. The motors operated by this company do the work of five horses, the cost of which would be \$1,250. This gives an average saving per horse of about \$209.

A combination company uses an average of 46 gallons of gasoline a month, costing \$138.25 a year, to which should be added \$50 for oil and other materials. These motors do the work of two horses or the cost for the work of two horses is \$94.12 a year, giving a saving of \$155.88 per horse.

BUILDING MATERIALS IN STREETS.

Like most other cities, Philadelphia has in the past experienced considerable difficulty in controlling the occupation of highways with building materials. The Bureau of Highways has just begun the use of a new form of permit by which it hopes to control the situation more successfully. The permit is in the form of a 9 by 12 card, which "must be displayed in a conspicuous location on the occupied highway at all times during the period of such occupancy." On this card are given the name of the party to whom it is issued, the date on which the permit expires, and the location to which the permit applies; also the regulations governing "storage of building materials," "construction of footway shelter platforms," "use of danger lamps," "placing of mortar beds and material heaters," and "conditions of occupied highway." It will thus be possible for every interested citizen to know whether the permittee is exceeding his privileges and to serve as a co-operating inspector; and Wm. H. Connell, the chief of the bureau, hopes that this co-operation will actually be secured.

The city ordinances require that building materials so stored shall occupy not more than 9 feet in breadth and 13 feet in height in front of the premises to be built upon or repaired, together with 80 feet of additional front if this may be necessary; the material to extend 1 foot inside the curb line, but leaving a gutter along the curb 15 inches wide and 12 inches high, with a clean-out hole 12x18 inches every 25 feet. The width is further limited by the requirement that a sufficient passageway shall be left at all times to permit vehicles to pass between the building materials and the opposite curb; and further that no materials or other obstruction shall be placed within 4 feet of any fire hydrant or crossing, or within 2½ feet of any railway track, or across any footway.

During the erection or repair of any building, a wooden platform or roof must be constructed along the whole front of the building and covering the area from a point 2½ feet from the wall out to the curb, located at least 10 feet above the sidewalk, and of sufficient strength to stop falling bricks, stone, lumber or other building materials. These must be painted dark green and can contain no advertising signs except those of the contractor and future tenant.

Anyone responsible for building materials or any other obstruction upon any part of a public highway, or for excavations in such highway, must keep a red glass lantern thereon lighted from sunset to sunrise; and if the obstruction or excavation is more than 10 feet long, there must be a lantern at each end.

Public highways paved with asphalt or concrete can not be used for the mixing of mortar or lime unless this be mixed in boxes with tight bottoms and elevated throughout at least 4 inches above the pavement, the sides being of 2-inch boards not less than 6 inches high; nor shall any fire be made thereon for melting of solder, heating roofing material, etc.

Materials stored in the highway must be so placed as to prevent their creating dangerous conditions or a nuisance. The permittee must maintain both the occupied area and the area adjacent thereto in a cleanly condition, removing all dirt and waste materials from such area and, if necessary, sprinkle the occupied and the adjacent areas as often as may be necessary to prevent dust from blowing about.

ECONOMICAL CLEANING OF CATCH-BASINS

Motor Truck Fitted with Dumping Body, and Crane and Grab Bucket for Removing Mud—Comparison With Old Method.

By C. L. EDHOLM.

With the use of a motor truck equipped with a crane and an orange-peel bucket, great savings have been effected in the cleaning of catch-basins in the borough of Manhattan, New York. Charles E. Gregory, engineer in charge of sewers, states that the present equipment is doing the work for about 85 per cent of the former unit cost, and that with contemplated improvements and a lengthening of the working day for the outfit, still greater saving can be made, so that the work will be done at about 66 per cent of the cost by the old method.

The truck is a five-ton Packard fitted with a metal body of $6\frac{1}{2}$ cubic yards capacity, though its usual load is about five cubic yards. This is a dumping body, and is unloaded in seven minutes. A crane built by a local company is set on the right side of the chassis, between the cab and the body, and back of it is a small platform on which the driver stands while operating the device.



Motor truck fitted with steel body of $6\frac{1}{2}$ cubic yards capacity; also with a crane operated by a power take-off which, by means of a grab bucket, removes the deposits from catch-basins. As many of these can be cleaned in a day by one truck and three men as by four of the regular carts and nine men, and the work is much less disagreeable for the men.

By means of a Packard power take-off, the motor supplies the power to operate the crane, winding about a drum the chain that carries the grab bucket. The bucket is of necessity small, as the catch basin openings are only two feet in diameter. It is lowered into the man-hole, and closed by means of an oil-operated piston; then is raised to a position higher than the truck body and swung over the body by turning the crane, and opened by a lever. At all times the mechanism is in control of the driver of the truck, the assistants being employed merely to guide the bucket into the opening of the basin and to swing the crane around.

At present there are used for this work 26 carts with iron bodies of one cubic yard capacity, each drawn by one horse. It is estimated that six of the special trucks would replace them satisfactorily, as the present test

shows that one truck will do the work of a regular basin-cleaning gang, which consists of four horses and carts, four drivers, four laborers and one foreman. In computing the difference in cost between the old and new methods, all items of expense were considered that might be charged against the machine, including 25 per cent for depreciation, so the estimate of saving is considered to be conservative. As the device has been in operation only two months in Manhattan, it is reasonable to suppose that its efficiency will be increased as the men become more accustomed to handling it; in fact, considerable progress was observed in that respect in this period, and certain mechanical details will be improved before the outfit produces maximum results.

Two men, or at most, three, can do the work of a gang composed of nine men, including the foreman. This point is of the utmost importance in view of the present labor shortage, which may continue indefinitely. As it is difficult to get men for ordinary manual labor, it is even more of a problem to find workers who will accept the intensely disagreeable and even revolting task of going down into a catch-basin and filling the buckets with filth, as is required by the old method. Therefore the fact that the orange-peel bucket does the most unpleasant part of the catch-basin cleaning and requires only one-third as many men to operate it as are needed by the old system, goes a long way toward solving the labor problem in the sewer department.

In the northern section of the Borough of Manhattan there are long hauls and heavy grades that make the removal of the sediment a very slow undertaking. Between 180th street and 110th street there is a dumping station at the North river and 130th street. A horse-drawn cart, with a cubic yard load, will require about an

hour to make the trip from 180th street to the dump, about 20 minutes to unload and about an hour and 25 minutes to make the return trip, which is up-grade. The truck will make the same distance in about 25 minutes each way. It is an important consideration also that the efficiency of the horse is greatly diminished by extremes of weather; icy streets make harder work for the horse, while in midsummer heat it must be carefully handled to prevent prostration; but such conditions do not affect the efficiency of the motor truck.

A secondary point, of interest to those who are studying the problem of street congestion, is the fact that if this department is motorized, twenty-six slow-moving carts will be replaced by six vehicles that travel with reasonable speed. This is a move in the right direction and if followed in other municipal departments would

remove a large number of small carts that add to the traffic congestion by their sluggish movement.

Mr. Gregory has been encouraged in developing this improvement by borough president Marks and commissioner of public works Ralph Folks.

WASTE DISPOSAL FOR SMALL MUNICIPALITIES

Methods of Collection—Disposal by Dumping, Burying, Reduction and Incineration—Classification of Incinerators—Cost of Incinerating.

The United States census for 1910 lists 1,827 places having a population of between 25,000 and 10,000 inhabitants. It is probable that communities of this size now number about 2,000. It is these communities to which this paper refers.

The author considers in his discussion the disposal of garbage, refuse and house ashes. The amount of garbage varies in different cities, but an average of reliable reports indicates that about 194 pounds per capita per annum may be expected. In few cities does this fall below 150 pounds or rise above 275. The amount of rubbish is much more indefinite. In four large cities the approximate is 1,250 to 1,600 pounds per capita per year, but in the smaller communities it will probably more nearly approach 1,000 pounds. Where natural gas has entirely replaced coal as fuel, the amount of combustible rubbish may considerably exceed this. The present high prices paid for old paper, iron, leather, rags, etc., has tended to decrease the amount of rubbish, there being agencies in almost every community that will remove them without cost to the community or householder. Ashes constitute the largest item of municipal waste, cost the most for collection, but give the least trouble for final disposal.

COLLECTION.

During the past few years several forms of patented wagons for collection of refuse have been proposed, mostly for use in the larger cities. Motor trucks adapted for this service are found to be economical in closely built places where daily collection is made, or for removal from storage stations to central disposal plants. But for small towns, no vehicle has been suggested that is an improvement over the horse-drawn cart, except a collection service by cans or a transportation in covered containers, which eliminate nuisance.

Several towns and cities have used the system of collecting cans or covered vessels from each house and carrying them to the disposal works, leaving a clean can in the place of each filled one removed. This method carried out in Sewickly, Pa., was described in *Municipal Journal* several months ago. This method is undoubtedly an advance over the old established one.

If the garbage is wrapped in paper by the householder and collections made twice a week in summer and once in winter, the additional cost would not exceed twenty-five per cent for collection and disposal. For suburban residential towns, the plan of wrapping garbage is well adapted, provided some form of reliable incinerator is used. For dumping, it has no advantage over the usual forms of collection, except the improvement of sanitary conditions in the household.

From information collected by *Municipal Journal* in 1915, the author has calculated the following average costs per capita: In fifteen places, disposal by dumping cost 46½ cents. In six places, disposal by feeding to

swine, 30½ cents. In twenty-seven places, disposal by reduction, 62.8 cents. From studies made by the author some years ago, he concluded that the approximate cost of collection and disposal of garbage by swine feeding was 17 cents to 20 cents per capita by contract work, and 22 cents to 25 cents by municipal work.

One feature brought out by recent reports is the tendency to transfer the work of refuse collection and disposal from the local health bureau to the engineering and street cleaning departments. Whether improper collection and disposal of waste effects the health of a community is questioned, but at any rate it appears certain that much greater progress is made in the treatment of municipal wastes when this is in charge of city engineers or similar officials, than when it is performed by the health bureaus. Of forty-eight cities which reported recently on this point, twenty-seven have entrusted this work to the city engineers, ten to departments of street cleaning, eight to city commissioners or managers, and only three to boards of health.

The separation of garbage from other waste matters is more necessary than the separation of any other class of refuse, because of its putrescibility. The process of fermentation is slow at first and for twenty-four hours no odors are noticeable. But after that length of time there is a gradual increase in the amount of odor and within a week or ten days the entire mass will generally be undergoing putrefaction. These times are considerably influenced, however, by heat and cold. Uncovered garbage attracts flies and the eggs are sometimes deposited in it; but as it takes ten days for a fly to mature from the egg, there is little probability of fly breeding in city garbage where collections are made weekly or more frequently.

Where the refuse is not collected by the city or parties with whom the city contracts for the service, it is the custom for the householders to pay the collector by the week or month, the price generally running from ten cents to twenty-five cents for each visit. In the aggregate this represents from \$4 to \$12 per year and imposes quite a tax on the householders. In some communities not more than one-third of the population receive such service, the others disposing of their waste in any way which they find available—frequently an insanitary one. The result of this is generally to considerably retard improvement in sanitary conditions in the community. If the money paid out in this way, where even half of the citizens have their garbage removed, could be handled by the town authorities for the benefit of all and an organized, systematic and sanitary method of collection and disposal be put in force, all citizens could be provided with a collection service which would add greatly to the benefits enjoyed by the entire community.

FINAL DISPOSAL.

It has been claimed that the reduction process can be economically employed in places where the amount of garbage is as small as five tons daily, but as yet no accurate reports are to be had from towns where this is being tried. It is also reported that producer gas can be made from city waste, allowing from 20,000 to 30,000 cubic feet for each ton of refuse, but this method is still in the experimental stage.

Dumping as commonly practiced is condemned alike by experts and laymen. If, however, the putrescible matter is put into the ground under proper conditions, many of the objectionable features are eliminated. The garbage should be deposited in trenches made in parallel lines and immediately covered with earth. The layer of garbage should not exceed six to ten inches, unless household ashes are mixed with it. If this earth burial is properly managed, there is little nuisance. The greatest difficulty

*Abstract of a paper by William F. Morse before the American Public Health Association.

is experienced in winter, when the ground is frozen, when it is difficult both to excavate the trench and to cover the garbage with earth; under which circumstances ashes may be used to advantage for covering. This method requires a larger area than dumping and one which is not always available in small places. Some authorities state that each ton of garbage properly buried each working day of the year requires from one-half to three-fourths of an acre of land. The soil slowly oxidizes and assimilates the material within twelve to twenty-four months, when the ground can be used again for the same purpose.

Combustible rubbish gives considerable trouble. It is bulky and must generally be disposed of in some way. Paper and light substances, if dumped and not covered, are carried by the wind in all directions. If such matters are burned on the dump, offensive volumes of nauseous smoke may be given off. Or dumps filled with combustible matter may take fire and burn for days and even for years. However, to bury this material unburned requires too great expenditure for ground, and makes the fill objectionable as a foundation for future dwellings. The best available solution is fire wisely used. If the combustible materials are carefully and continuously sorted out from the dump and burned under proper conditions, the nuisance is minimized and the other objectionable features eliminated.

Feeding to swine imposes extra work upon the householder, as the garbage must be delivered free from foreign substances. Cleaning compounds or strong disinfectants, poisons, medicine and other matters which occasionally find their way to the garbage pail may prove seriously injurious to hogs eating the garbage. The advantage to the householder is the removal of the garbage at no cost, and generally at short intervals, since the garbage should be fed fresh. The town also is relieved of the cost of collection. It should require wagons of a suitable type, regular times of collection, and cleanly ways of transferring garbage from small cans to collecting wagons. Where garbage so collected is fed to large numbers of hogs by contractors, there are often complaints of nuisance by the adjoining property holders and continued objections and litigation. Low cost for cheap and insanitary service does not always compensate for the annoyance, discomfort and unwholesome conditions created by this method.

There are now thirty-two reduction plants in active use, four owned and operated by cities and two other municipal plants under construction. The smallest plant capacity is thirty tons per day, in a city of 65,000 population, and it is believed that this is at present the smallest community for which the system is commercially practicable.

INCINERATION.

The first high-temperature destructor was built in 1906 at Westmount, Canada. Since then there have been twenty-nine separate installations in twenty-four different cities in the United States, Canada and Cuba; one large plant is now under construction in Canada and two other large cities are nearly ready to contract for such plants. All these are municipally owned and operated. These destructors have capacities of from twenty-five tons up to three hundred tons daily. The smallest place having a destructor has a population of 18,000 and finds it economical to use the power for city lighting. Since the initial cost of a destructor plant and its equipment is large, and the capital charges correspondingly great, only the larger cities can profitably adopt this method, unless there are exceptional opportunities for using the power developed in the city service. In eighteen cities having destructors of capacities varying from 50 to 300 tons and

burning an average of 1550 tons of unseparated waste each twenty-four hours, the initial cost for plant and equipment, exclusive of ground, was from \$850 to \$1,000 per ton. Such costs are beyond the means of small communities.

Incinerators other than destructors are built in units of from five to twenty-five tons capacity, operate with natural chimney draft, and develop no steam power except where they are an auxiliary to steam boilers.

Incinerators adapted for municipal service may be roughly classified as single-grate and double-grate. Single-grate incinerators are simple rectangular structures with thick walls and roof, and floored with grates of iron or iron and fire brick. They have no secondary fires for destroying smoke, have low brick or steel chimneys and are charged through openings in the roof or by means of a platform on rollers sliding through a large door. In all cases flames from a side or end firebox that burns fuel pass over the refuse to a chimney flue at the opposite side or end of the furnace. This is the simplest form of incinerator. Burning at low temperature by moderate draft does not produce heat sufficient to destroy the gases given off, and if some means for regenerating these is not provided, there will be incomplete combustion and offensive smoke and odors from the chimney. Various devices are employed for obtaining heated air for combustion or for supplying forced draft by electric power, but most of these are repetitions of former appliances used and discarded by other builders. No reports are available from these incinerators that give accurate details of initial cost, quantities consumed, operating expenses or repairs. From inquiries made in 1915, it appears that for cities and towns of the population of 5,000 up to 25,000 the average cost for plants exclusive of ground would approximate \$295 to \$400 per ton of waste destroyed and that the operating costs for labor are from 30 cents to 60 cents a ton.

When considerable quantities of wet garbage are to be treated by fire, some preliminary drying is needed for evaporating the moisture and fitting the other matters for combustion. This is accomplished by using an upper grate for drying out the charge and a lower grate for deflecting the heat below the upper one. In addition to these there is a combustion chamber floored with a secondary firebox over which all gases produced by the primary fires must pass and where they are reheated and finally destroyed or transformed into invisible and inodorous carbon dioxide. The construction is of fire brick throughout, since iron grates could not withstand the high temperatures developed. Primary fires are placed at one side or end and charging is done through the roof. Temperatures approximating 1250 degrees Fahrenheit are obtained in the combustion chamber, which are sufficient to destroy all the gases. This destruction of gases and the preliminary evaporation of moisture are the distinctive features of this class of furnace. The calorific value of all combustible matters is fully utilized. The single-grate incinerators were first introduced in 1887, and improved in 1906 by adding a second grate, and this latter type of construction has held its own against all other forms of incinerators constructed. The United States Government still has in use a garbage crematory built in 1890 along these lines and by far the largest number of incinerators used by the Federal Government are of this improved design. For special uses, when very wet quantities of waste, like sewerage sludge, are to be destroyed, for special forms of trade refuse, for hotels or public institutions, this form of incinerator has been preferred to all others. Since the construction is stronger and the whole plant more durable, the initial costs are somewhat higher than for other incinerators.

The complete installation exclusive of ground, with a capacity of five to twenty-five tons per day, will cost from \$375 to \$500 per ton.

Water jacketed incinerators are built with two exterior walls of steel plates, between which water circulates. There are two grates, an upper one of 3-inch piping connected to heaters below, and above expanded into a water and steam chest covering all of the upper part of the furnace. This piping forms a cradle or long basket for receiving waste through charging openings above. There is continuous circulation of water through the walls, piping and steam chest, which gives protection to all parts of the interior against the high temperatures. The lower grate, forming the bottom floor, is of the usual iron construction. The smoke and gases are drawn by induced draft through a regenerator, similarly to the method employed in destructors. The heated currents of air from the regenerator are by forced draft conducted under the lower combustion grates. A secondary gas-consuming fire is placed near the base of the chimney when necessary. This incinerator is built in units of twenty-five to one hundred tons capacity, with high chimneys, and demands a larger area of ground than other constructions of the same capacity. In cities with a population of 10,000 and upward, the average cost for a plant complete has been approximately \$850 to \$925 per ton of daily capacity.

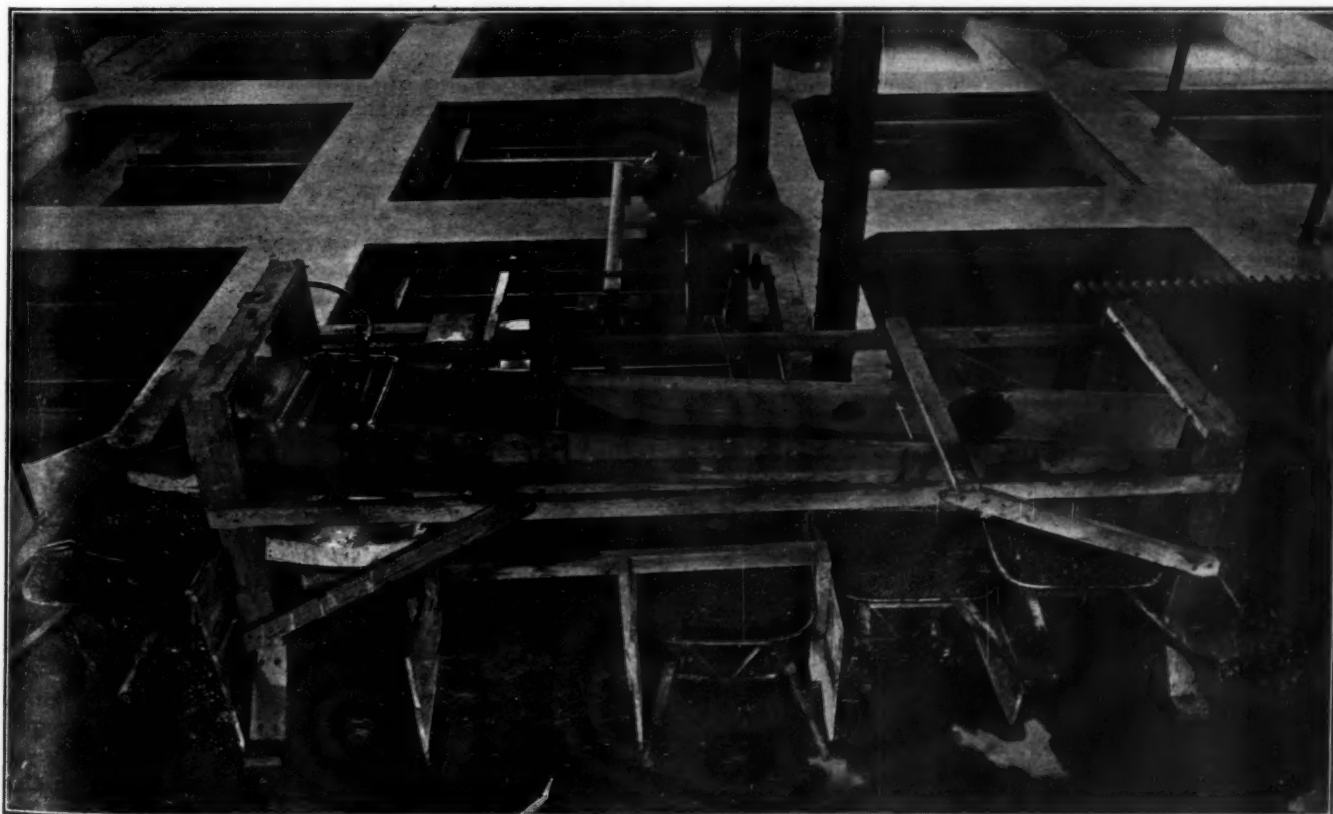
Special incinerators are used in some cases for burning combustible matters separated from garbage and ashes. A picking belt or movable platform is usually provided, from which the salable parts of refuse, such as paper, iron, glass, rags, etc., are recovered and marketed. All worthless parts are then burned and steam power is obtained from a boiler connected to the furnace, which is used for operating the plant and lighting and heating it. The incinerator used is similar to the double-grate incinerator previously described, but with special features

required for burning this particular kind of refuse. It can be built of any required dimensions and capacity from twenty-five tons up, with a corresponding power for developing steam. In several of the larger cities where the garbage and ashes are taken care of by other agencies and the combustible rubbish is difficult to dispose of, these installations are found to be of considerable value. The sale of the recovered marketable refuse returns a revenue over all expenses and capital charges, with a remaining profit to the city. This method dates from 1899, when the first permanent plant was designed and installed by the author in the city of Boston. Such an incinerator is hardly available for small communities unless the rubbish is collected separate from the other materials and the quantity is greater than is usual. In one residential city of 25,000 population, collecting salable refuse and baling it on the collecting wagons returns a small profit over expenses.

In addition to the above there are several forms of refuse furnaces, generally built by local constructors and following designs that frequently include features of the patented incinerators. Little or no reliable information is available concerning these.

SCREENING GRAVEL FOR FILTRATION PLANT.

The illustration shows a device used in the municipal filtration plant at Grand Rapids, Mich., for separating gravel and sand into five grades by screening. It consists of a long chute set on a slight slope, the bottom of which consists of five screens of different mesh sizes, each end of the chute being suspended by rods from a heavy frame. The space under the chute is divided into bins by board partitions, so that each bin is under the entire area of one screen, and each bin is just large enough to receive a wheelbarrow, which is placed directly under the screen. Above the higher end of the



GRAVEL-SCREENING APPLIANCE, GRAND RAPIDS FILTRATION PLANT.

chute is a grid of four pipes, connected with the water supply, through holes in which water is discharged into the chute.

The frame is oscillated by a motor which transmits its power to a shaft, and this in turn through cams produces the horizontal motion desired. Gravel is shoveled into the upper end of the chute, where it is washed by the water, the water and clay passing out through the finest screen, and the gravel travelling down the chute by the influence of the oscillation, passing over the screens in succession, and the larger stones finally falling into the bin at the open end of the chute.

Three men are used in shoveling the gravel into the chute and in removing the screened gravel as the barrows are filled. The entire outfit, including the motor, costs less than \$75.

LEGALITY OF ZONE ORDINANCES*

Decisions by the Courts of Several States Concerning the Rights of Cities to Prohibit Certain Commercial Uses of Property in Residential Sections.

During the past few years there has been a growing interest in the matter of zone ordinances, the primary object of which is to permit the establishment and growth of residential districts, protected from the invasion of industrial or commercial enterprises.

There are four ways in which the segregation of the uses of property may be made: First, by restrictions placed voluntarily upon the use of property before an addition or subdivision of the city is sold to different lot owners. Second, by requiring the dedication to the public of the power to control the use of property in a given addition or subdivision by refusing to approve the plat for record unless such dedication is made. Third, by the use of the power of eminent domain. Fourth, by proceeding under the police power of the state.

The first is of but a temporary nature, since such restrictions are usually confined to a fixed period of years, after which the use of the property may be changed. As to the second, the Washington state law provides that the county auditor shall not receive or record any plat or map of a given addition until the same shall have been approved by the mayor and common council of the municipality in which the property so platted is situated. Heretofore, such approval has been granted if adequate street facilities are dedicated, but the author believes that the dedication of the control of the use of the property might also properly be made a condition precedent. This method, however, offers but a partial solution, for great districts are already planned and built up and as to these no remedy is afforded, since the provision of the statute applies only to the planning of future additions. As to the use of eminent domain, under this doctrine private property can be taken only for a use dedicated to the public, after making compensation for the same. The object of city planning is, to a large extent, to prevent the owner of property from putting the same to a particular use, rather than to make a use of the property; in other words, the object is negative in character, while the power of eminent domain is positive, and it might therefore be questioned whether negative use would be covered by the principle of eminent domain.

Control by exercise of the police power seems to offer the most favorable opportunities. The principle underlying this power is the old maxim that "The welfare of

the people is the highest law." In the state of Washington, the police power can be exercised by cities in any way which is not in conflict with the general laws, and consequently it is not necessary for individual cities to appeal to the legislature for permission to extend the police power to cover the control of the use of property.

In other states, however, cities and towns are not possessed of such broad privileges under the right to exercise police power. Several states have passed legislation permitting city councils, upon proper petition, to establish residential, commercial and industrial districts. The city of Chicago is now considering the matter and a bill is to be introduced at the next session of the Legislature giving the city authority to create districts within its corporate limits. Minneapolis is working on a zoning plan. The city council recently appointed a committee called "Committee of Thirty," to devise a plan and draft a necessary bill for presentation at the next session of the legislature whereby the city can be zoned upon a comprehensive plan.

Considering adjudicated cases, several decisions have held it beyond the power of cities to enact ordinances limiting the use of property, in effect zone ordinances. The city of New Orleans passed an ordinance making it unlawful to establish or operate any sort of business whatever on a given avenue. An action was brought to enjoin the enforcement of the ordinance and the court held that the enactment was beyond the power of the city. (*Calvo v. City of New Orleans*, 67 So., 338.)

The city of Denver passed an ordinance making it unlawful to build, erect, or make addition to, a terrace, apartment house or flat, store building or factory of any kind, rooming house of more than thirty rooms, hotels, or any buildings similar, in a given district, unless the party desiring to build had first secured the written consent of a majority of the owners of the property in the same block on both sides of the street, to such building. Because the building inspector of the city would not issue a building permit to one who had not obtained such consent for the construction of a one-story brick store building, mandamus proceedings were brought to compel the issuance of the permit. In condemning the provisions of the ordinance, the court held that a store building is in no sense a menace to the health, comfort, safety or general welfare of the public and that the regulations considered in the ordinance had no relation to the general welfare of the public, but merely attempted to limit the owner in the use of his property. (*Willison v. Cook*, 130 Pac., 831-832.)

Another ordinance of Denver prohibited the manufacture of bricks without the permission from the owner or owners of residences within twelve hundred feet of the place of manufacture, or within twelve hundred feet of a public school house or city park at all. In the case of *Denver v. Rogers*, 104 Pac., 1042, the court held that the ordinance was so manifestly radical, unjust and oppressive, and that its effect was so clearly to take and destroy property without due process of law, that its invalidity was apparent.

The city of Minneapolis passed an ordinance making it unlawful within a specified residential district to erect any buildings except those for residential purposes, and specifically prohibiting the erection and maintenance therein of hotels, stores, factories, warehouses, dry cleaning plants, public garages or stables, or any industrial establishment, or any business whatsoever. The Supreme Court of Minnesota in the case of *State ex rel. Lachtman v. Houghton*, 158 N. W., 1017, held that this ordinance, insofar as it sought to prohibit the erection of an ordinary store building, was beyond the power of

*From a paper by Walter F. Meier, Assistant Corporation Counsel of Seattle, before The League of Washington Municipalities.

the municipality. This decision was not by a unanimous court, two judges holding in favor of the ordinance.

The foregoing are illustrative of the decisions holding against the regulation of the use of private property as planned by zone ordinances. Such holdings are based upon the idea that unless the prohibitions have a definite relation to the public health, morals, welfare and convenience they cannot be sustained.

To collect and review all cases passing adversely upon this question would be a prodigious task, because in many instances the state courts have been slow to adopt the doctrine that in order to sustain a given piece of legislation it is only necessary to inquire whether a state of facts *could* exist which would support it. They have frequently undertaken to determine whether or not such state of facts *actually* existed. But popular views change and a higher civilization develops. As illustrative of this, the following are some of the cases in which the regulation of the use of private property by ordinances akin to zone ordinances has been sustained.

The city of Spokane enacted an ordinance making it unlawful to locate, build, construct or keep in any block in which two-thirds of the buildings were devoted exclusively to residence purposes, a livery, boarding or sales stable, or a private stable where more than five head of stock were kept, within two hundred feet of any such residence, on either side of the street, unless the owners of a majority of the lots in any such block fronting and abutting upon the street, consented in writing to such location or construction. In passing upon the validity of this ordinance, the supreme court in the case of *Spokane v. Camp*, 50 Wash., 554, said:

The ordinance is prohibitive, but leaves the right to the citizen to waive the prohibition if he chooses. Statutes of this character are common, and while it is generally conceded that the legislature cannot delegate its legislative function, it is well established that it may provide for the operation of a law which it enacts upon the happening of some future act or contingency. The local option laws in their various phases are common instances. While these laws were violently assailed, and in some instances received judicial condemnation, they are now almost universally sustained.

An ordinance of Little Rock, Arkansas, made it unlawful to conduct or carry on a livery stable business within a specified district. A firm that had for many years prior to the passage of the ordinance conducted that business within such district brought an action in equity to restrain the enforcement of the ordinance, alleging its conduct of the business for many years, that expensive improvements made by it would be lost if the ordinance was enforced, that there was no other available site in the city where its business could be profitably conducted, and that the action of the city council in prohibiting the carrying on of any livery stable business in such district was unnecessarily discriminatory and in violation of the Fourteenth amendment. This case went to the Supreme Court of the United States, and that court upheld the validity of the ordinance. (*Reinman v. Little Rock*, 59 Law Ed. 900.)

We find that the same rule may be applied to the location of hospitals. The Washington supreme court had occasion to pass upon this question in the case of *Shepherd v. Seattle*, 59 Wash., 363. It appears in that case that the city of Seattle enacted an ordinance making it unlawful to establish or maintain any private hospital or sanitarium for the treatment of inebriates, or persons suffering from insanity or other mental diseases, within a building situated within two hundred feet of any private property, the owner of which had not consented in writing to its location and maintenance. The validity of the

ordinance was attacked in an appropriate proceeding, but the court sustained it, saying:

This, in our opinion, is a valid and reasonable police regulation. The presence of a private insane asylum, with its barred windows, and irresponsible inmates, would annoy, injure and endanger the comfort, safety and repose of any person of average sensibilities if located within two hundred feet of his place of abode. In other words, it is a matter of common knowledge that the presence of such an institution in a residential portion of a city would practically destroy the value of all property within its immediate vicinity for residence purposes. If so, it was proper and competent for the municipal authorities to require the assent of the injured parties to its location and maintenance.

It is to be noticed that, in this last case, not only does the court lay emphasis upon the fact that the establishment of hospitals within a given district has a tendency to destroy the value of nearby property for residential purposes, but it bases its decision, to no small extent, upon that fact. There are many other decisions which uphold similar ordinances and there is a marked tendency on the part of the courts to resort "to sound common sense," using the words of our supreme court in the case of *Everett v. Paschall*, 61 Wash., 47, in determining whether or not a given matter interferes with the public health, morals, welfare and convenience.

Someone may suggest that the matter of conducting a livery stable or maintaining a hospital is so well within the realm of subjects requiring regulation that the cases heretofore referred to do not furnish a safe rule when applied to zone ordinances. But we find that the same rule has been applied to the matter of operating public laundries within the residential districts. An interesting case illustrative of this is the case of *Ex parte Quong Wo*, 118 Pac., 714. It appears from the opinion in that case that the city of Los Angeles enacted ordinances which divided the city into seven industrial districts, all portions of the city not included in such districts constituting a residential district. By ordinance it was declared to be unlawful to maintain certain kinds of occupation within such residential district, among the prohibited industries being public laundries and wash houses. Quong Wo was charged and convicted of maintaining a public laundry and wash house within the residential district. He applied for a writ of habeas corpus but this was denied. Whereupon he took an appeal to the Supreme Court of California, where the judgment of the trial court was affirmed. In the course of its opinion, the court took occasion to say that the business of conducting a public laundry was a lawful and necessary occupation and one that was not necessarily a nuisance *per se*, pointing out that that fact alone, however, did not determine whether or not it was necessary to regulate the conduct of the same for the safety, health and comfort of society at large.

The court also points out that unwholesome trades, slaughter houses, operations offensive to the senses, the deposit of powder, the application of steam power to propel cars, the building with combustible materials, and burial of the dead may be properly banished from the center of dense masses of population on the general and rational principle that every person ought to so use his property as not to injure his neighbor; concluding that doubtless the same considerations which would support such legislation would warrant a municipality in prohibiting the operation of public laundries in densely populated neighborhoods devoted to residence purposes. The court further takes occasion to say:

The design of the ordinance here involved undoubtedly was to protect such portions of the city of Los Angeles as are devoted principally to residence purposes from the dangers and discomfort attendant upon the operation of

certain kinds of business which, while not necessarily nuisances *per se*, have always been recognized as proper subjects of police regulation. We do not feel warranted in saying that, as to public laundries and wash houses, the conclusion of the city council was clearly unreasonable.

We find also that public garages may be lawfully excluded from districts devoted to residential purposes, upon the theory that the operation and maintenance of such institutions therein materially interfere with the public comfort. The case of *People ex rel. Keller v. Oak Park*, 107 N. E., 636, upholds the ordinance of the village of Oak Park making it unlawful to build or maintain a public garage on any site where two-thirds of the buildings within a radius of five hundred feet of the proposed site are used exclusively for residential purposes without the written consent of a majority of the property owners within such radius, citing the previous decision of the Illinois Court of Appeals *v. Ericsson*, 105 N. E., 315.

One of the most interesting decisions sustaining a zone ordinance is that rendered by the Supreme Court of the United States on December 20, 1915, in the case of *Hadacheck v. Sebastian*, U. S. Adv. Ops. 1915, p. 143. In this case the Supreme Court was called upon to determine the validity of the Los Angeles ordinance which prohibited the operation of a brick yard or brick kiln or any establishment, factory or place for the manufacture or burning of brick within the residential district of the city. Hadacheck was the owner of eight acres of land containing valuable beds of clay for brickmaking purposes, being of the value of about \$800,000 for such purposes, but not exceeding \$60,000 for residential or other purposes. It appears that a brick making establishment was located upon this tract prior to its incorporation within the city limits of Los Angeles. To excavate the clay and transport it to some other point where brick kilns were permitted under the ordinance and thereafter transport the finished product to the places where the same would be used entailed an expense which rendered such operation prohibitive. The Supreme Court of California had sustained the validity of the ordinance and a writ of error was prosecuted to the Supreme Court of the United States. After reviewing all of the contentions of the plaintiff in error and the decision of the state court, the United States Supreme Court declined to reverse the decision.

This decision has inspired the hope of those interested in seeing residential districts within our cities protected from the invasion of industrial enterprises. As a result of this decision, many cities are now planning to use the Los Angeles zone ordinances as a basis upon which to build their own. Campaigns of education are being carried forward with the hope that as the personnel of the courts is changed there may be brought to the assistance of the movement men imbued with the idea that the law is a progressive science and not one based solely upon established precedents.

REFUSE DISPOSAL IN TOLEDO.

Among the news items in our issue of November 30 was one from Toledo, Ohio, on page 684, in which the statement was made that a reduction plant for the city would cost \$360,000 and that the cost for operation would be \$55 a ton. Our attention has been called to the latter part of this statement, which is very evidently incorrect. As these were the figures furnished to us, however, we asked the city sanitary engineer, Watson G. Harmon, to give us the correct figures, and learned from him that the statement made by him was that "the reduction of garbage, with the sale of grease and tankage, would allow a net revenue of about 55 cents per ton of garbage treated."

We desire to make this correction, both for the information of our readers and in justice to Mr. Harmon.

WATER FOR STEAM BOILERS.

The water supply furnished by municipalities is used to a greater or less extent in most cities for boilers in steam power plants, both great and small, some of these being merely the small plants used in office buildings for operating elevators and other machinery and occasionally for individual lighting plants. In addition to this, in most cities thousands of residences are supplied with steam heating plants, in which boilers are used for creating the steam used for heating the houses.

The quality of the water supplied by municipalities with reference to its use in steam boilers is, therefore, a very important matter, but one which is frequently entirely lost sight of because of the overshadowing importance of the quality of the water in relation to the health of the community. In a paper presented this month before the American Society of Mechanical Engineers, by Arthur C. Scott and Professor J. R. Bailey, the matter of water for steam boilers was discussed at some length and the importance of quality was brought out most strikingly. According to these writers, a prominent boiler inspector has said: "If I were asked to state the most frequent cause of steam boiler explosions, meaning the tearing asunder of any part of a boiler by force of steam pressure, I would unhesitatingly say it is scale."

If water in a boiler comes in direct contact with the hot plates or tubes, these, if free from scale, remain practically at the same temperature as the water. Scale, however, is a very poor conductor of heat, and if there be a greater or less thickness of scale on the plates or tubes, they may be heated to a plastic temperature and finally fail, owing to the pressure of the restrained steam.

An additional disadvantage of scale is the waste of fuel occasioned. Laboratory experiments have indicated that a scale one sixty-fourth of an inch thick causes a waste of two per cent of the fuel, and a scale three-fourths of an inch thick causes a waste of ninety per cent of the fuel; and while it is quite unlikely that losses as high as these would be caused by scale in actual practice, yet there seems to be little question that there would be a more or less considerable loss. There are other troubles also due to scale, among these being the possibility that it will clog feed pipes and water gauge and steam gauge connections, and prevent the complete closing of valves.

In addition to scale, there are other qualities of water which cause trouble, among these being carbonic acid gas, occluded oxygen, and sodium and magnesium chlorides. "Corrosion due to the chloride ingredients is particularly destructive of steam boiler tubes, hot water pipes and brass-seated valves. Galvanized steam pipe is not immune to the action of these salts, because any defect in the zinc coating permits the setting up of local galvanic action between the zinc and steel in the presence of salt water, with the consequent rapid destruction of the zinc coating. Water which contains as much as 500 parts per million of either or both of these chlorides, as is sometimes the case with deep-well water, may be regarded, especially when hot, as a water destructive to steel pipe and fittings." The authors state that they have known of several steel well casings that were corroded through in a few years.

Some waters are both scale-forming and corrosive. Certain alkali salts in water cause foaming or priming in boilers, and silt, organic matter, loosened scale, lubricating oil and other matters are occasionally causes of this phenomenon.

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MACADAM STILL BEING BUILT.

So common has become the statement that macadam roads have proved their inability to stand the peculiar kind of wear produced by automobiles that there is naturally a more or less general popular impression that the day of the macadam road has passed. This is by no means the case, however, as there probably is still to be found in the country as much water-bound macadam as all other kinds of road put together; and if we include in the list macadam which has had merely a surface treatment of oil, the ratio will be found largely in favor of the macadam road.

At a recent meeting of the New York City Association of County Highway Superintendents, many of those present gave it as their belief that a macadam road is an economical one for certain classes of travel, basing the calculation of economy on the total annual expense, including both maintenance and sinking fund. In that state most of the roads built recently are macadam, constructed with two courses of stone, the lower course being sometimes of a cheap local stone, while a more expensive trap or other durable stone is used for the top course. In some cases these roads are at once given a surface treatment of tar or asphalt, but usually this is deferred until traffic over the road has developed any weak spots, which are thereupon repaired before oiling is done.

The general idea in connection with the economical use of macadam now appears to be to build the body of the road of this material and adapt the surface to the particular kind and relative amounts of traffic. Thus, if the traffic is light and the surface deterioration therefrom comparatively slow, the expenditure for surface treatment with oils would probably not be economical. On the other hand, where there is considerable automobile traf-

fic, the maintenance of the surface can probably be effected more economically by the use of oils than without them.

This general realization of the economy of adapting maintenance methods to kind and intensity of wear has resulted from a study of cost records covering the maintenance of many miles of roads, and is one of many recent indications that where such cost records are carefully kept and intelligence is used in the trying of different methods, important progress can be made in developing greater economy in road maintenance.

MASSACHUSETTS PLANNING BOARDS.

The legislature of Massachusetts in 1913 authorized the creation of local planning boards to "make careful studies of the resources, possibilities and needs of the city or town, particularly with respect to conditions which may be injurious to the public health or otherwise injurious in and about rented dwellings." A number of these boards have been organized, and they in turn have organized themselves into a Federation of Planning Boards. This federation has begun issuing brief bulletins from time to time describing in detail the first steps in city planning, beginning with the thoroughfare system and continuing in order of their usual importance.

In interpreting the act for the benefit of Massachusetts cities, the Committee on Functions of this federation states that the continuing function of these boards is to collect data on present local conditions from which a reasonably accurate forecast of future needs may be made. Further provisions of the act, in the opinion of this committee, allow the planning boards to make comprehensive plans for the physical development of the whole community, and further provide for preparing an annual report which shall give information regarding the condition of the city or town and contain plans or proposals for the development of the city or town and estimates of the cost thereof. This is as far as the act goes in defining the functions of these boards, but it is suggested that further functions are desirable. For instance, that they should serve as platting commissions or boards of survey, having a certain measure of control over the subdivision of private property. Such control is now had by town selectmen, city engineers, or other officials.

One of the important functions, and perhaps the one which should first receive attention, is the preparation of an official plan. What such a plan should be is outlined by the federation in one of the bulletins referred to. Such a plan, says the bulletin, should ultimately show all the aspects of the city plan that can be fixed on a map. (There are certain principles which cannot be shown in this way, such as housing laws and other regulations.) This official plan should be drawn on a standard topographical map of the city, preferably to a scale of not less than 200 feet to 1 inch. It should show, in addition to existing conditions, proposed locations of new, relocated, and widened streets, parks, public buildings, waterways and other public property; railroads, electric lines, utilities, and other quasi-public property; and building lines and other means of control of private property. In amplification of the general plan, detailed plans, sections and grades, and diagrammatic plans and other explanatory data will also be needed, to indicate the precise application of the plan.

The physical aspects of the city that are shown on the plan may be classified under the three general heads of circulation, public property, and private property. Circulation may further be subdivided into streets, railroads, and waterways. The street plans may to advantage show, in addition to the location, the widths of sidewalks

and other subdivisions, the car lines, underground utilities such as pipes, conduits, etc., and surface accessories such as trees, bridges, monuments, etc. Under public property, features may be classified under the head of administration, education and recreation; the first including post office, city hall, police and fire stations, water-works, markets, etc.; schools and libraries being included under education, and recreation including the playgrounds, parks and the like. Private property, it is suggested, may be subdivided into zones of use, fire districts, building height districts, and building lines and other easements and restrictions.

While the powers and functions of these planning boards are as yet more limited than many would like to see them, they furnish opportunity for an excellent step in the right direction, and it would seem to be very probable that if cities of the state show an inclination to utilize to the limit the present powers conferred upon planning boards, the legislature will enlarge them from time to time as policy seems to suggest.

SCHOOLS FOR STREET CLEANERS.

In the November 23rd issue of Municipal Journal, in the description of the proceedings of the Society for Street Cleaning and Refuse Disposal, the statement was made that the New York school for street cleaners which was inspected by the Society, "is the only institution of the kind in the world" and "has been in operation less than a year." The assistant superintendent of streets of Chicago, W. J. Galligan, has called our attention to the following extract from the report of the Chicago Bureau of Streets for 1914: "During the year the School of Instruction for Street Cleaners was organized and three classes, one on the south side, one on the west side and one on the north side of the city, meet once each week for demonstration and instruction. The classes were made up of a supervisory sweeper from each ward, classes being conducted by ward superintendents. Proper handling of the tools and most effective methods of cleaning were taught. The supervising street cleaner subsequently visited each sweeping route in his ward, instructing the regular cleaners. It was surprising to note the wide variations in the handling of tools and the consequent results obtained. The plan is considered an excellent one and will be continued next year."

Mr. Galligan informs us that this street cleaning school has held weekly sessions during the past year with very good results and is now a permanent part of the organization.

KNOWLEDGE CONCERNING CITY STREETS.

It is a more or less common statement, sometimes made as a complaint by city officials, that criticism of the public works departments of a city would be much less frequent if the citizens generally were better informed concerning the work done by such departments. The Women's Municipal League of the City of New York is endeavoring to bring to the attention of all citizens that information which will give them a helpful knowledge of the work done by their public officials. In a leaflet issued by this League, entitled "What We Should All Know About Our Streets," fourteen questions with their answers are given as a very condensed statement of certain facts. While the answers will vary with different cities the questions would apparently apply to all. These questions are as follows:

What Department of the City government would you notify if the ashes had not been collected on your street for several days?

If the sidewalks on your street are not kept clean, who is to blame?

If the roadbed is not cleaned each day, who is responsible?

If snow has fallen, whose duty is it to clean the walk?

If a dead cat or dog is lying in the roadbed of the street where you live, what should you do?

When you eat an orange or banana on the street, where do you put the skin?

When you eat your lunch in the park, where do you put the paper?

When on the street or in the cars, what should you do with newspapers after you are through with them?

If street signs are lacking, to whom should it be reported?

What becomes of the garbage and ashes collected on Manhattan Island?

If the roadbed needs repairs, to whom should one write?

If the sidewalk is broken, who must repair it?

May we build a bon-fire or chop wood in the street? If not, why not?

FINANCING WATER WORKS EXTENSIONS.

Various methods have been adopted in different cities, generally by private companies, we believe, for requiring real estate to guarantee adequate returns from the cost of extensions into streets where little revenue seems to be promised for the near future. In St. Louis the owners are required to deposit with the water commissioner the entire estimated cost of the pipe extension. After the completion of the pipe work the Water Division refunds to the depositor a certain amount for each dwelling or building which is built facing the street in which the main was laid and which has a water service pipe connected to the main. This refund varies from \$50 to \$100, depending upon the extent of the work, character of the building, etc. The payments are of course discontinued when the total reaches the amount originally deposited.

ISHPEMING'S GARBAGE INCINERATOR

Description of Incinerator Having Capacity of Twelve Tons in Ten Hours—Cost of Operation—Method of Collection.

Ishpeming, Mich., a city of about 15,000 population, early this year put into operation a garbage incinerator and new method of collection which is reported to be giving excellent satisfaction. These were described recently by Mayor J. S. Wahlman as follows:

"After careful investigation into the merits of the different plants, a two-unit incinerator of the Hunter-McGuire type was decided on, an ordinance providing for the disposal of garbage, offal, manure and other kinds of refuse matter was adopted, and an efficient, sanitary system of garbage disposal inaugurated.

"The incinerator building is 27 feet 6 inches in size. The walls are built up with tapestry brick on the outside and common brick on the inside. Roof trusses and roof boards are of pine covered with slate. Underside of roof and trusses are painted with fireproof paint. Floors and stairway leading from upper to lower floor are of concrete.

"The garbage is dumped on the upper floor at the openings of the furnaces, the teams passing through the building. Heavy cast steel caps cover the furnaces, and are lifted by a Yale and Towne triplex chain block that is carried by an overhead track. This block is also used in the handling of dead animals and other heavy matter. This feed floor is provided with catch basins through which the floor may be washed into the city sewer, the building being connected with the city sewer system.

"All garbage goes direct to the furnace floor, there being no grates except in the fire box where the coal is

burned. The flames from the fire box of the furnace are carried against an inclined wall, thence to one that deflects the heat current over the top of the furnace, thence on around the opposite side and to the starting point, making a regular swirl of flame and creating intense heat.

"The average temperature in the furnaces is about 1,700 degrees, often exceeding 2,000 degrees, and all this heat is forced by a down draft directly on top of the garbage, so that all the gases with all the odors are here entirely consumed. There is absolutely no odor in or about the building. Families live within 75 feet of each side of the plant. The furnaces are equipped with a Brown electric pyrometer, for measuring heat intensities. This pyrometer registers the degrees of heat in the hottest and the coldest parts of each furnace.

"The plant is handled by one man and has a capacity of 12 tons of garbage per day of ten hours.

"Whatever residue is left after the operation of the furnace is raked into a litter carrier, swinging from an overhead track, and run out on a trestle that connects with an old worked-out mine pit close by, where it is dumped.

"A hot water coil and tank is connected with the furnace for heating water for sterilizing purposes. This hot water, produced without any extra cost, is used in keeping the building clean, and in sterilizing garbage wagons.

"A steel garbage wagon, having a capacity of three yards, has been purchased. This wagon has a perforated false bottom which allows all liquids in the garbage to be drained into a space in the bottom of the wagon. On arrival at the plant this liquid is drawn through a faucet into the catch basin in the dumping floor. After being dumped, the entire wagon is sterilized with hot water before leaving for another load.

"For the months of March, April and May, 1916, the amount of coal and garbage consumed, and the cost of operating the plant and collecting garbage were as shown in the accompanying table.

Month	Pounds of Coal	Pounds of Garbage	Time to Consume	Reading of Pyrometer	Coal Used in Stove Pounds	Furnace Number
March	10,700	46,000	55 Hrs.	1200-2000	2,700	1
	10,400	57,000	71 Hrs.	1200-2000		2
Total	21,100	103,000	126 Hrs.		2,700	
	23,800 lbs. coal @ \$5.40 per ton.....					\$64.26
	Collecting garbage					402.00
	Labor at plant.....					72.45
	Incidentals (light, telephone, etc.).....					21.73
	Total cost					\$560.44
April	11,100	64,800	84 Hrs.	1200-2000	3,000	1
	9,100	61,500	74 Hrs.	1200-2000		2
Total	20,200	126,300	158 Hrs.		3,000	
	23,200 Lbs. coal @ \$5.40 per ton.....					\$62.64
	Collecting garbage					\$97.98
	Labor at plant.....					64.05
	Incidentals					11.30
	Total cost					\$535.97
May	15,800	107,600	136 Hrs.	1200-2000	2,100	1
	14,600	97,500	121 Hrs.	1200-2000		2
Total	30,400	205,100	257 Hrs.		2,100	
	32,500 Lbs. coal @ \$5.65.....					\$91.81
	Collecting garbage					487.20
	Labor at plant					74.25
	Incidentals					8.50
	Total cost					\$661.76

"In the cost of collecting garbage as given is included the collecting of ashes, which are not hauled to the incinerator, but are used for grading purposes.

"The quantity of coal used per ton of garbage consumed, I think, will be greatly reduced as the man in charge becomes more efficient in the handling of the plant. This was clearly demonstrated during the test of the plant at its completion, when it was handled by the builders. The consumption of coal per ton of garbage consumed during this test was about 130 pounds. Dur-

ing this test a dead horse weighing about 1,200 pounds was consumed in less than an hour.

"To secure the best results, kitchen garbage should be drained and as far as possible wrapped in paper. Section three of the ordinance providing for the disposal of garbage, etc., reads as follows:

"Every householder, domestic servant, or other person who shall attend to the preparation, use, cooking, dealing in or working of meat, fish or vegetables, whether in a household, restaurant, inn, or hotel, shall drain, so that such household garbage and any or all other garbage to be drained, shall not contain more than 25 per cent water, and shall wrap same securely in paper before depositing in garbage can.

"This ordinance also provides that garbage cans shall be of metal with tight fitting covers, and that the capacity of such shall not exceed five cubic feet."

The figures in the table give the cost of collecting the garbage for the three months as \$7.80, \$6.30 and \$4.75 per ton, respectively; and the expenditures for incinerating (not including interest, depreciation and superintendence) as \$3.07, \$2.19 and \$1.70 per ton respectively. The amount of coal burned per ton of garbage consumed was 462 lbs., 367 lbs. and 317 lbs. respectively.

TRAFFIC ORDINANCES IN COLUMBUS.

Columbus, O., in October passed a new traffic code which, while most of it naturally contains features common to those of other cities of its size, is quite modern in several of its provisions. Among those of especial importance, in view of the present agitation concerning motor trucks in city streets, may be quoted the following:

No vehicle in excess of eight feet six inches in width over all shall be propelled or driven upon or over the streets of this city, except on special permit and for a definite route to be issued for that occasion by the director of public safety.

All five-ton and over motor truck vehicles shall have their motors equipped with governors or other similar device, so that said motor truck cannot exceed eight miles per hour, which device shall be kept sealed when said vehicles are in operation on the streets.

No load in excess of twelve tons in weight, including the weight of the vehicle, shall be propelled or driven upon or over the streets of the city; provided, however, that the director of public safety may issue permits in special cases for the carrying of heavier loads, where the load is indivisible, upon or over certain streets specially designated in the permit.

No person shall transport over the streets or alleys of the city, in a vehicle having tires of less than three and one-half inches in width, a burden, including weight of vehicle, of more than 6,000 pounds. For vehicles having tires more than three and one-half inches in width, the load, including the weight of the vehicle, shall not exceed 600 pounds per lineal inch of width of tire.

Nothing herein shall be construed as prohibiting the hauling of more than twelve tons in a train made up of a power vehicle and trailers; provided, however, that the number of trailers in such train shall not be greater than is sufficient to haul three separate loads and that the weight of each load, including the vehicle, shall not exceed twelve tons. A train of such vehicles shall carry a brakeman on the rear vehicle.

No motor or other power vehicle carrying a weight in excess of three tons, including the weight of the vehicle, shall be operated upon any of the streets or alleys of the city at a speed greater than eight miles per hour.

Upon all streets, public ways, public grounds and public parks of the city of Columbus, in and upon which there has been, or hereafter shall be, made and constructed a roadway of asphalt, stone, brick or other hard substance or material especially adapted for use by heavy vehicles, and where there may also have been constructed or shall hereafter be made and constructed any additional roadway, or roadways, of macadam or other soft substance or material specially adapted for use by carriages, buggies and other light vehicles, it shall be unlawful for any person to drive or run any heavy vehicle or motor vehicles on such roadways so made of macadam or other soft material.

The WEEK'S NEWS

Chicago Paving Condemned by Expert—New Jersey's Auto Law Sustained—Mortality in the United States—Health Surveys in Dallas and Utah Cities—Texas Cities' Sewerage Systems—Water Problems of California—City Against Company in Pontiac, Norwalk, Washington and Birmingham—Springfield, Mass., Defeats Federal Charter—Snow Cleaning in New York City—Interurban Trolley Systems in Litigation—Boston Solves Bridge Car Safety Problem—How the Cities Are Combating the High Cost of Living.

ROADS AND PAVEMENTS

Expert Condemns Chicago Paving Practice.

Chicago, Ill.—Professor Ira O. Baker, eminent paving and construction expert, of the University of Illinois, has submitted his report on paving work in the city to Alderman Charles E. Merriam, chairman of the finance committee of council. An exhaustive investigation, covering several months' study, was made by the engineering staff of the finance committee, which is really the former efficiency division of the civil service commission, under F. H. Canfield, staff engineer, and James Miles, chief. Professor Baker made a three-day personal inspection of paving and asphalt plants and conferred with the chief engineer. He studied the specifications in use and the results of the technical staff's investigation. In his report Professor Baker states that quantities of cement in concrete and of bitumen were below the amounts specified. In curbs and gutters concrete was found too dry and effective expansion joints were scarce. The thickness of concrete base for asphalt pavement was found to have been skimmed. On this last item alone the city was out \$200,000 on the jobs of the season. Relations between contractors and inspectors were reported to be rather doubtful as it was found that the inspectors received money from the contractors, presumably for overtime work. Professor Baker makes a number of constructive recommendations urging improvements in specifications, construction and inspection. He makes suggestions for increasing the definiteness of specifications. He urges training, instructions and a merit and demerit system for inspectors. Of the 114 inspectors employed, 66 were under civil service and 48 temporarily engaged. He urges also that thorough studies be made of the traffic factor in the choice of pavement type; costs of maintenance and cleaning under varying conditions of type of pavement and traffic; tests of sand in concrete, and field tests.

Supreme Court Sustains New Jersey's Auto Law.

Washington, D. C.—The Supreme Court of the United States has sustained the validity of the automobile license tax law of New Jersey. The decision, delivered by Justice Brandeis, is of interest to every state with similar tax laws and to touring autoists. The law, with its revenue-producing feature, was attacked by Francis J. Kane, a motorist, who did business by auto between New York and Pennsylvania, as an unconstitutional restriction of the right to carry on interstate commerce. Kane, a resident of New York, was arrested while driving in New Jersey. The following facts were stipulated at the trial: Kane had been duly licensed to drive in Jersey and New York. His car was registered in New York, but not in New Jersey. Besides failing to register his car, he also had not filed with the New Jersey secretary of state a necessary paper designating that official as his attorney upon whom legal process could be served. When arrested Kane was on his way from New York to Pennsylvania. Kane contended at the trial that the New Jersey statute was invalid as to him because he was a non-resident, because it violated the Constitution and laws of the United States regulating interstate commerce, and also because it violated the Fourteenth Amendment. These contentions were reviewed by the New Jersey courts and the state was sustained, and thence the case was brought to the highest court by a writ of error. In his opinion Justice Brandeis said: "The power of a state to regulate the use of motor vehicles on its high-

ways has been recently considered by this court and broadly. It extends to non-residents as well as residents. It includes the right to exact reasonable compensation for special facilities afforded, as well as reasonable provision to insure safety, and it is properly exercised in imposing a license fee graduated according to the horsepower of the engine (Hendrick vs. Maryland, 235 U. S. 610). In view of the speed of the automobile and the habits of man, we cannot say that the Legislature was unreasonable in believing that ability to establish by legal proceedings within the state any financial liability of non-resident owners was essential to public safety. There is nothing to show the requirement is unduly burdensome in practice. It is not a discrimination against non-residents, denying them equal protection of the law. On the contrary, it puts non-resident owners upon an equality with resident owners." Justice Brandeis held that reciprocity, while a convenience, is not an essential of valid regulation.

Competition for Street Design.

Pittsburgh, Pa.—Frederick Law Olmsted, well known city planning expert, and F. F. Nicola and Benno Janssen were the judges of a street improvement competition held under the auspices of the Pittsburgh Beaux Arts Salon. Eighteen sets of drawings were submitted in this unusual competition which was open only to Pittsburgh architects, engineers and students. The purpose of the competition was to bring out plans for encouraging the elimination of the commonplace right angle street intersection by substituting circular or octagonal treatment which would increase aesthetic effects and traffic facilities.

City to Control Pavement Openings.

Springfield, Ill.—The city council has taken its first definite step toward its plan of repaving the entire business district within the fire limits before the fall of 1918, by adopting the formal suggestion of the board of local improvements that any necessary tearing up of street pavements within the next two years be done under the direction of the council. This will make it impossible for any individual or company arbitrarily to tear up pavements for the purpose of repairing conduits, underground wires, gas or water pipes, and will prevent the installation of any work which would interfere with the tentative plan of the city. The action of the council will affect the water, light and street departments of the city itself, as well as the Springfield Gas & Electric department and others who might tamper with the sewer or water connections.

SEWERAGE AND SANITATION

Mortality Statistics for the United States.

Washington, D. C.—Several interesting facts are presented in a preliminary report on mortality in 1915 issued by the United States Bureau of the Census. Gratifying progress has been made in the prevention of tuberculosis during recent years. In only a little more than a decade—from 1904 to 1915—the death rate from that disease in all its forms fell from 200.7 to 145.8 per 100,000, the decline being continuous from year to year. The death rate from pneumonia has shown a marked decline since 1900. Its fluctuations from year to year, however, have been pronounced. The death rate from cancer has risen from 63 on 100,000 in 1900 to 81.1 in 1915. There were 54,584 deaths from this malady in 1915. The increase has been almost continuous,

there having been but two years, 1906 and 1911, which showed a decline as compared with the years immediately preceding. It is possible, however, states the report, that at least a part of this increase is due to more correct diagnoses. Typhoid fever is rapidly losing its deadliness, figures of the report show. In 1900 the rate was 35.9 per 100,000, but last year it had decreased to 12.4. "This decline is greater, relatively," says the report, "than that shown for any other important cause of death. The total number of deaths due to typhoid in 1915 was 8,332." A summary of the other principal diseases and their effects in 1915 follows:

Disease.	Deaths.	Rate per 100,000
Heart disease.....	105,200	156.2
Pneumonia	89,326	132.7
Bright's disease and acute nephritis..	70,500	104.7
Apoplexy	53,397	79.3
Diarrhoea	48,325	71.7
Arterial diseases.....	15,685	23.3
Diabetes	11,775	17.5
Influenza	10,768	16.0

Complete "Clean Town" Survey.

Salt Lake City, Utah.—An annual sanitary survey of the state known as the "Clean Town" contest has been practically completed under the direction of the state board of health. James H. Wallis and C. Frank Emery, in charge of the work, have visited 162 cities, towns and villages of the state, and made careful inquiry regarding the disposal of sewage, care of the water supply, garbage collection and disposal, presence of flies, sanitation of school houses, and investigated the matter of caring for foodstuffs on sale. They have investigated the conditions of streets and alleys, lawns and flower gardens, and noted the condition of vacant lots. Homes have been visited also and their cleanliness, sanitary conditions and ventilation carefully inspected. The work was done after the cities had been advised of the proposed survey and notified that awards would be given to the cities of the various classes which made the better showing. Dr. T. B. Beatty says the contest has resulted in marked improvement in the quality of the water supply in a dozen cities and in cleaner streets and alleys.

Sewerage Systems in Texas.

Austin, Tex.—Of 141 sewerage systems in Texas, 25 employ septic treatment without other purification, 37 employ septic tanks with contact beds or filters and 34 have Imhoff tanks with filters, while 26 towns discharge raw. Under the anti-pollution act six cities are exempted from its provisions. They are: Houston, Galveston, Beaumont, Port Arthur, Orange and Corpus Christi. Notwithstanding this exemption, however, Houston and Corpus Christi are arranging to have all their sewage treated and thereby eliminate all possible nuisance. Statistics collected by the state sanitary engineer show that 94 sewer systems in Texas are municipally owned, 5 belong to counties, 3 belong to the state and 39 are operated by private franchise. In 13 cities free sewer service is given to the citizens. The total sewer mileage in Texas is 1,699 miles. The largest main is at San Antonio, 72 inches; the smallest at Winnsboro, 4-inch. The state sanitary engineer insists that not less than an 8-inch main should be installed in any town except for house laterals. Houston Heights, Greenville and Cleburne are credited with having the best regulated sewers in Texas. Approximately \$2,179,000 has been spent and is being expended in Texas this year in new sewer construction and equipment for the disposal of sewage.

Smallpox Spreading.

New York, N. Y.—Reports from the United States Public Health Service of an alarming spread of smallpox in nineteen states have caused the local health authorities to fear that the disease may appear in epidemic form in New York. Both Dr. Charles F. Bolduan, of the city health department, and John T. Black, secretary of the state board, have issued warnings that those who have not been vaccinated within five years should be revaccinated as a precaution. In a letter to Dr. Bolduan, Secretary Black urges that every means be taken to prevent the disease gaining a foothold in New York, as he believes it would be hard to

check here. A bulletin issued early in the month showed 58 new cases in Connecticut, of which 35 are in Waterbury and 11 in Torrington. Ohio statistics show 125 cases in Cleveland, and there are 87 cases in North Dakota, 67 in Washington, and 25 each in Virginia and Texas. "The last outbreak was in 1902, and our statistics indicate that a return of the disease may be expected about once in seven to fourteen years," said Dr. Bolduan. "Probably this is because during an epidemic the need for vaccination and revaccination is forcibly brought forward, and all persons not otherwise immune are treated. With the subsidence of the epidemic people again become careless, and in a few years there are many imperfectly protected persons to take the disease."

Federal County Health Survey.

Dallas, Tex.—Dr. F. E. Harrington, field representative of the United States Public Health Service, has been investigating the advantages of each of the counties which have applied for a federal sanitation survey. The applying counties are Dallas, Hill, Williamson and Montgomery. Upon the recommendation of Dr. Harrington, the federal government will select one of the four counties. The survey is to begin Dec. 5, and will cover every phase of public health. The government makes three requisites of the selected county: That the county health officer will co-operate in making the survey, that the working force be furnished headquarters, and that the county will follow up the work established by the survey. Five men will be assigned to the investigation. They will spend four months in making a house-to-house canvass of the rural sections, gathering data on all health subjects, giving especial attention to typhoid fever, infantile diseases and soil infection diseases. The cities of the county will not be included in the survey. No part of the expense of the survey is to be borne by the county. This will be the first survey for Texas and the second for the South, Alabama having had a survey a few years ago. The information collected will be disseminated among the residents of the county and also placed at the disposal of the entire state.

WATER SUPPLY

Report on Water Problems of California.

Sacramento, Cal.—The state water problems conference, which was created under the terms of the act for the purpose of recommending to the Legislature "a unified state policy with reference to irrigation, reclamation, water storage, flood control, municipalities and drainage, with due regard to the needs of water power, mining and navigation," has made its report to Governor Hiram W. Johnson. The conference went out of existence automatically on November 30, 1916. The conditions as to the water resources of the state are fully explained and urgent recommendation is made for the inauguration of a state policy in development thereof. As such development must come largely through private capital, measures are suggested to encourage co-operation on the part of land owners and capitalists, while properly safeguarding state interests. State aid for reclamation, irrigation and flood control districts is recommended by the issuance of state bonds underlying the district bonds, the state to be safeguarded by the control of the plans, construction and operation of works, and by collection of assessments through the machinery of the county tax collectors' offices, with sale of lands for non-payment of assessment. It is recommended that control of all water matters be placed under three commissions, with powers similar to those of the railroad commission, their findings in matters of fact to be final. The three boards are the water commission, the irrigation board and the flood control board (which will take over the duties of the present reclamation board). Each commission is to consist of three members, devoting all their time to the duties of the office, and the same person may be named at one salary as member of two commissions, thus encouraging a gradual consolidation of commissions when such plan shall appear wise. Riparian rights are strongly assailed in the report as the greatest bar to development of water resources in the state and partial remedies are suggested.

Irrigation is conceded to have a superior right to navigation where the two clash. Where navigation is still necessary, canalization is recommended. Attention is called to the great value of inland waterways, in this regard, and extensive investigations recommended to determine if the state cannot afford to construct and maintain through the Sacramento and San Joaquin valleys open water highways, on which the public will be free to operate craft for business and pleasure, as they now operate vehicles on wagon roads.

It is shown that the state has water power resources superior to any state in the Union, save one; that these resources are utilized at present only to the extent of one-tenth of the maximum, and that a great field exists for manufacture of electro-chemical products, aside from probable increased demands for ordinary purpose of light and power. Modification of present restrictive Federal regulations is suggested. Surveys and investigations by the state engineering department are recommended to determine the number and extent of storage sites in the mountains, the purpose for which storage could be best used, the districts to be benefited, and the cost. A plan under which one superior judge shall try all water cases; changes of the law of eminent domain, so that property needed for public purposes can be taken at once; a repeal of the principle of "progressive development," as applied to municipal water supply; a more liberal policy as to interstate waters, and repeal of the law forbidding diversion of water needed for fish life, are among the other features of the report. The conference was composed of ten state officers, acting ex officio, and of six citizens appointed by the governor. Organization was effected in September, 1915. The personnel included the late John M. Eshleman, lieutenant-governor; W. F. McClure, state engineer; W. A. Johnstone, chairman state water commission; V. S. McClatchy, president state reclamation board, and J. P. Baumgartner, chairman state conservation commission.

Population Double—Consumption Half.

Houston, Tex.—Last month marked the tenth anniversary of the purchase by the city of the waterworks. The plant was appraised at \$1,081,000, but the city finally secured it from the Houston Water Company for \$896,423.20. The city assumed the plant's bonded indebtedness of \$467,000 and issued \$434,000 in bonds for its purchase and improvement. For years the people had objected to the company's service and in 1906 when its franchise ran out they refused at an election to continue it. At that time there were 68 miles of mains and 58 wells. Today there are slightly more than 121 miles of mains and 72 wells. Daily consumption in 1906 was 10,300,000 gallons for a population of 73,017. Now it is only 5,283,000 gallons for 130,000 persons. Since 1906 practically the entire city has been metered, and before that there were no meters. Construction of the plant was started in 1876 and operation was begun in 1878.

Plan Big Filtration Plant.

Detroit, Mich.—Water board engineer Theodore A. Leisen, acting under orders of the board of water commissioners, is working out the preparatory details of a big filtration plant for Detroit, to have a capacity of 320,000,000 gallons of water a day at the outset, while the final capacity probably will reach 350,000,000 to 380,000,000 gallons per day through additions to be made from time to time. The water board recently instructed engineer Leisen to make borings and tests and make a survey of the big project, which will be located on the present water works property. Meanwhile an experimental filtration plant with a capacity of 5,000,000 gallons a day, is being completed, and probably will be in operation by January 1. The cost of the filtration plant contemplated by the water board will be close to \$4,000,000, it is estimated. Additional filter beds would be added to the original installation as needed, with beds handling approximately 250,000,000 gallons to be installed when the filtration plant is started, each of the beds to have a capacity of 4,000,000 to 5,000,000 gallons a day, and to be of concrete construction, entirely enclosed. Just when the projected plant will be started is not yet decided, but engineer Leisen is giving much time and study to planning the details and arranging for the important undertaking.

STREET LIGHTING AND POWER

Utility Manager Arraigned for Bad Service.

Pontiac, Mich.—The city's gas troubles were brought to a climax when Harry B. Wales, general manager of the Michigan Light Company, was arraigned in justice court on a charge of violating the regulating ordinance on gas by permitting the candle-power and pressure of the supply to become too low. The penalty under the ordinance is a fine not to exceed \$300 and imprisonment in the county jail until the fine is paid for not to exceed three months. Wales recently explained that inability to complete a retaining tank because of delay in steel shipments was the cause. More recently an accident in the plant further crippled the service. The city commission contends the plant is insufficient and that the steps being taken will not remedy the situation. The complaint charges that Wales "on three consecutive occasions not on any one day, within a period of thirty days, knowingly and wilfully manufactured and distributed gas, in said city, found to have a calorific value of less than 550 British thermal units gross per cubic foot and less than 16 candle-power light," after an employee and an agent of the company at its office had been notified in writing after a number of tests to that effect. The tests were made by city gas analyst White. The calorific value of the gas in British thermal units was found in the tests to be 540, 524 and 500. The minimum value allowed in the ordinance is 550 British thermal units gross per cubic foot at any one time, and a monthly average of 590 is demanded. Instead of the minimum of 16 candle-power allowed at any one time, the tests on the same three days showed the actual value to be 14.2, 14.7 and 11.6 candle-power.

Order Lighting Company Out of City.

Norwalk, O.—The city administration has made its first move in the campaign to establish municipal lighting, by serving notice on the Cleveland & Southwestern Railway Co. to remove, within thirty days, all its poles, wire and equipment from the streets of the city of Norwalk. R. D. Wickham, city attorney, expects the opposition of the company, but states that the administration is prepared to fight the case to the finish. Mayor Anderson says: "The Southwestern company has never held a franchise in the city of Norwalk. The company had a contract with the city which terminated more than a year ago. The people of this city voted for municipal lighting by a 10 to 1 majority. The city is prepared to install municipal lighting and we have facilities for taking over new subscribers as rapidly as they enter applications."

The Washington Valuation Cases.

Washington, D. C.—Twenty-three million dollars is the approximate estimated cost of reproducing the property and business of the Potomac Electric Power Company, as of July 1 last, according to an investigation conducted by Harold Almert, consulting engineer, of Chicago, report of which was formally laid before the public utilities commission. The report increases the reproduction cost as estimated by the valuation bureau of the commission by more than \$6,000,000. Mr. Almert estimates the cost of the land and reproduction of buildings, machinery, overhead and underground lines, stores, working capital, etc., at \$16,922,522.63, to which he has added the cost of organizing the company, cost of financing, cost of developing the business, etc., making a total estimated cost to reproduce the property and business of the company of \$23,235,387.63. The figures of the valuation bureau of the commission, submitted several months ago, showed the estimated cost to reproduce the physical property of the company to be about \$10,000,000. This estimate does not include any amounts for the cost of organizing the company, cost of financing or cost of developing the business. For these items, Mr. Almert allows more than six million dollars, which brings the total up beyond the twenty-three-million mark. Mr. Almert was the first witness when the power company began the presentation of its case in the valuation proceedings. Two years ago Mr. Almert began the work of placing a valuation upon the properties of the Potomac Electric Power Company. His report estimates a valuation as of

July 1 last, whereas the company, it is understood, will emphasize the fact that the commission's report is of July 1, 1914, and does not represent present value, inasmuch as it does not make allowance for additions to the property of the company since that date. Among the principal items of the Almer report are cost of reproducing real estate, \$830,967.44; buildings, \$1,095,682; power plant and equipment, \$2,246,816.86; transmission and distribution system, \$7,152,312.38. With respect to organization and other expenses, which the company claims are required by the utilities act to be valued, but which are not contained in the report of the valuation bureau, Mr. Almer's report contains the following allowances: Legal organization and franchise expense, \$262,542; financing, expense of negotiating only, \$60,000; compensation to conceivers, \$650,000; preorganization expense, \$25,000; brokerage and commissions, \$700,000; development cost, \$2,500,000.

Profitable Municipal Light Plant.

Iola, Kans.—The city's light plant, according to George Freeman, commissioner of finance, will soon reach the point where, with all debts paid, a dividend will be declared and the profit placed to the credit of the city's general fund, where the law says all surplus must go. Iola has an electric fund surplus of \$3,700 now, but, to take care of any emergency, the money is kept on hand as a working fund. Iola purchased its plant of private interests ten years ago for \$10,000. A sinking fund takes care of the bonds, which must run twenty years. On January 1, this year, improvements in the plant had brought the investment up to \$58,000 and it was found that a profit of \$10,000 had been netted for the preceding twelve months. Since the first of the year further improvements have been made to equip the plant to take care of constantly increasing business, so that to-day the city's investment is \$78,500. Records for eight months of this year show receipts \$6,200 in excess of the corresponding period in 1915. All improvements have been paid for and not a dollar of indebtedness has been incurred. Even though the gas supply for Iola's plant should fail completely, as it does occasionally, the electric rate would not have to be increased, commissioner Freeman said. The engines are equipped with oil burners, ready to be put in service the instant gas goes out. Severe cold weather, waning gas fields and breaks frequently call for the use of emergency fuel. There are 870 consumers of current in Iola and the number is growing as rapidly as line extensions can be made. The domestic rate is a flat four cents per kilowatt hour. For commercial service, day load, the rate ranges from four cents for a 2-hour day load down to two cents.

Vote Approves Street Lighting Contract.

Omaha, Neb.—The five-year street lighting contract was sustained at a special referendum election by a vote of 11,064 to 8,788, a majority of 2,276 in favor of the contract. Nine of the twelve wards of the city voted for the contract. The election will cost the city approximately \$6,500. The approval of the contract insures reduction of electric lights from 8 to 6 cents per kilowatt hour to small consumers beginning January 1, without opposition by the light company. The referendum petitions which required the election were circulated by R. B. Howell, general manager of the municipal water plant, and backed by city commissioner Butler. According to the terms of the contract, the city will have 1,071 additional lamps, making a total of 2,488. The old arc lamps will be replaced by new 400-candlepower Mazda lamps. The lamps in the ornamental lighting district will be placed as follows: Two lamps will be mounted on each ornamental iron post, four lamps to the block, placed on opposite side of the street and supplied with current from conductors laid in underground conduits. Outside of the downtown ornamental district the lamps will be hung from center suspensions or mast arms and supplied with current from overhead conductors or mounted on ornamental iron posts and supplied with current through underground conduits. The contract price for the lamps will be \$31 per year for the lamps hung from center suspensions or crossarms; \$36 per year for the single ornamental lamps; \$68 per year for the double-unit ornamental lamps. It is expressly stipulated

that the annual expenditure by the city shall not exceed the annual appropriation for electric street lighting. In figuring the money which will be available the city electrician and city commissioners determined that 1,071 new lamps may be added to the present system without adding to the annual expenditure. The contract contains this provision: "It is further agreed that if the city should at any time during the life of the contract acquire all of the property of the company, then future profits, if any, which otherwise may have been realized from the performance of this contract by the company, shall not be considered and allowed as an item having any value to the company." Under the contract the city will have 261 twin unit ornamental lamps, 71 single unit ornamental lamps and 1,895 overhead units. General G. H. Harries, president of the Omaha Electric Life and Power Company, has announced that his company will expend \$100,000 in new equipment necessary in carrying out this five-year contract.

Company Not Allowed to Change Rules.

Birmingham, Ala.—The Birmingham Railway, Light and Power Company will be permitted to make a general reduction of 5 per cent. in its rates for electricity in Birmingham, but will not be permitted to change the rules under which it will operate in that city. This decision was announced by the Alabama public service commission at Montgomery. The street railway and lighting company presented the schedule carrying the reductions with several new rules which it proposed to put into use. James Weatherly, member of the Birmingham commission, and M. M. Ullman, city attorney of Birmingham, opposed the proposed changes in rules on the ground that they would operate against the interests of the city. One rule, which the company sought to invoke, provides that the company cannot be forced to supply electricity to any person living more than 150 feet from its wire unless the person constructs a transmission line for the distance at his own expense. At present the company is forced to bear the expense of laying the lines. Through the decision of the public service commission, the reduction in lighting rates will become effective without the granting of any concessions by the consuming public.

FIRE AND POLICE

Nearly 1,000 Firemen Fight Blaze.

New York, N. Y.—One of the most difficult and dangerous fires ever occurring in Brooklyn swept a storage warehouse and damaged a piano factory and other buildings and did a total damage of over \$100,000. For the first time in eight years, fire apparatus from every part of the borough was called to the scene of the blaze. Altogether it is estimated that nearly a thousand firemen were fighting the flames. Only the strenuous work of the department saved the block. A thick smoke hung over a large section of the borough and sparks threatened the elevated railroad structure and nearby buildings. Every hydrant within a mile radius of the burning warehouse was in service. Several firemen narrowly escaped death or injury when walls fell close to them. Traffic was tied up on the streets around the building.

Whole Department at Big Cotton Fire.

Columbia, S. C.—The shed, machinery and 2,500 bales of cotton of the Columbia Compress and Warehouse Company were destroyed by fire of unknown origin, entailing a loss of \$250,000. The fire for awhile endangered nearby oil and other plants. Every member and all the available equipment of the entire Columbia fire department combined in the efforts to check the flames, which for a time seemed almost uncontrollable. A still night was of decided advantage to the firemen. While some of the firemen were overcome there were no serious injuries.

Fire Sweeps Village.

Millbrook, N. Y.—A fire which raged through the village of Millbrook for five hours was checked by volunteers from the neighboring countryside. The loss reached \$150,000.

Altogether nine buildings were totally destroyed, including practically the entire business portion of the village. Six families lost their homes and all their possessions. A three-story hotel, a large barn and livery stable and several stores were first to go. The fire started in the hotel and leaped the street, spreading northward, fanned by a light wind. Millbrook has practically no fire apparatus. Apparatus was asked of Poughkeepsie, but this city was handicapped by an accident which prevented the sending of steamers. Many families removed their household effects to the outskirts of the village.

Insurance and Fire Loss.

New York, N. Y.—Fire commissioner Adamson recently stated that the fire insurance companies in the metropolitan district collected during 1915 \$30,000,000 in premiums. The fire loss in the same period was only \$6,000,000.

GOVERNMENT AND FINANCE

Springfield Keeps Old Government.

Springfield, Mass.—The city again refused to exchange its old charter for a new one and voted by a majority of 2,919, 7,344 against 4,425, against the proposed "federal plan" of government at the municipal election. The city manager plan was rejected at the state elections. These results end, temporarily at least, the long movement for charter revision. Although all admit that the present form should be improved, even the last vigorous movement, publicity campaign and the work of the charter board could not get the desired effect.

Woman Elected Mayor, Defeating Husband.

Umatilla, Ore.—Mrs. E. E. Starcher has been elected mayor of Umatilla, having defeated her husband in the election. Women also were elected to almost all other offices in the municipal government, including four seats in the council, recorder and treasurer.

Commission Plan Defeated.

Emmetsburg, Ia.—The special election held here to vote on the commission form of government in order to drive from power Mayor Sanders and the city council resulted in defeat of the new plan by a vote of 430 to 162. The fight on the mayor and council was headed by H. Mayne, publisher of a local newspaper, and the contest was very spirited.

STREET CLEANING AND REFUSE DISPOSAL

Garbage Reduction Products in Demand.

Cleveland, O.—By-products of Cleveland's municipal garbage reduction plant are reported to be in big demand. A record price to be received on the output of tankage for 1917 will add an unexpected \$10,000 to the city's 1917 revenue. Under the bid submitted the city will receive about \$57,600 for 6,000 tons of the fertilizer as against \$48,000 received for tankage in 1916. The city is also receiving record high prices for the garbage plant grease output. The demand for the city garbage products appears to be so great that the high bidder on the tankage submitted a new and still higher bid in a telegram following the first bid to public service director Alex Bernstein. The second bid overtopped the first by \$3,000.

Would Force Citizens to Clean Snow.

New York, N. Y.—Alarmed at the possibility of a shortage of labor to deal with heavy snowstorms this winter, Street Cleaning Commissioner T. J. Fetherston sent a personal letter to each member of the Board of Aldermen asking for support in getting needed legislation through the board. The commissioner says that it will be impossible to obtain a force of men sufficient to handle a real snowstorm, and, therefore, the aldermen should so amend the ordinances as to extend those facilities of the department which can be employed without a large force of extra laborers, and to take other action which will obtain the active aid of citizens in removing snow. The commissioner asks the board to repeal or amend the ordinance prohibiting the

use of salt on snow. The reason for the passage of this ordinance some years ago, he says, was that the use of salt was the cause of damage to horses' feet. The commissioner says that automobiles have almost entirely displaced horses on many of the city's main streets and the objections to the use of salt has become eliminated. The commissioner also thinks that something should be done by the aldermen to make effective the ordinance requiring householders to remove snow from abutting sidewalks. He suggests, further, that the street cleaning commissioner should have the power to call upon all owners or occupants of property to open passageways for vehicles through the snow in front of their respective properties. Ordinances covering these points have been drafted by the commissioner and submitted to the aldermen. While in his letter to the aldermen the commissioner states that he will need 15,000 extra laborers in case of a snow storm, he said that he could really use nearly three times that number in handling a heavy fall of snow. An evidence of the difficulty he is having in securing the enrollment of emergency laborers are the figures for the first seven days of registration in each of the three seasons. Two years ago these figures were 22,250; last year they were just under 5,000; this year they are 3,548. Not only is it impossible to obtain laborers for emergency snow work, but there is a shortage of men on the regular sweeping and collecting forces. The men are leaving to take other positions at higher pay. The civil service list is exhausted, and, although the commission has employed every available means, it has not been possible to replenish the list.

New Garbage Regulations Follow Plant Completion.

Butte, Mont.—Dr. T. V. Moore, official physician and health officer of the city, has sent out thousands of circulars describing the garbage regulation which goes into effect Dec. 15. By that date the city's incinerating plant for burning all garbage and refuse will be completed and from then on only ashes, cans and the like will be taken direct to the city dump. Hereafter it will be unlawful for any person or persons to mix or place in the same receptacle, garbage of class A and class B. Refuse of animal and vegetable matter, waste, sweepings, paper and all other refuse, and filth of every kind, are held to be included in class A. Ashes, tin cans, etc., are classified under class B. Persons failing to comply with this health regulation will be obliged to hire a scavenger to separate such garbage within five hours, and failure to do this will be punishable by a fine, and the city will see that the garbage is so separated and charged to owner, agent or tenant.

TRAFFIC AND TRANSPORTATION

Utility Commission's Powers in Question.

Trenton, N. J.—There will probably be an appeal from the decision rendered in the Supreme Court by Justice Trenchard upsetting the order of the public utilities commission, requiring the Atlantic Coast Electric Railway to issue transfers to passengers in Asbury Park and Bradley Beach, for the principle involved is of wide importance. The commission had held that reasonable service on the part of the trolley company required the granting of transfers. The company, in its appeal to the courts, insisted that as the municipality had, through a contract, ratified by ordinance, permitted the location of tracks in the streets in return for an agreement that no more than five cents should be charged for a single fare, the commission had no power to enforce a rate that in effect would be lower than that fixed by ordinance, which constituted an irrepealable contract. Justice Trenchard has now sustained the company's contention. If this decision should be sustained on appeal, the result, it is stated, would be equivalent to nullifying regulation of rates charged by public utility corporations in every case where similar ordinances are in effect, and these are numerous. The interpretation in the Supreme Court is that where an ordinance requires that "no more than five cents shall be charged by the company" it fixes the nickel as the minimum as well as the maximum fare, regardless of any changes in conditions that have been brought about since the contract was made. The public utilities commission has always held

that the utility law gave the power to revise rates downward where a maximum rate had been fixed by contract, provided that the existing rate was found to be unfair or discriminatory.

Belt Railway Proposal Defeated.

Seattle, Wash.—The port commission have definitely announced the defeat at the recent election of its proposal for the issue of \$450,000 of bonds for construction of a belt line railway along the waterfront. The proposition received a majority, but not the required 60 per cent.

Are Interurbans Street Cars?

Houston, Tex.—The Galveston Court of Civil Appeals has held that the interurban is a trolley system and not a railroad and therefore the local interurban is not trespassing on property owner's rights. The plaintiff in the test case is to carry it to the Supreme Court. The case involves not only millions to interurbans throughout the state, but also their future development. More than 50 suits against the Galveston-Houston Electric Company, now pending in the local courts, will be decided through this test case. The case takes on a nation-wide aspect, because it is not only the first decision of its kind in Texas, but similar cases are pending throughout the United States. Heretofore honors have been about even and decisions conflict. The court held that the operation of an interurban on the street is not an additional burden to the highway, but is in ordinary use. Should the Supreme Court reverse the Court of Appeals the Interurban Company will be forced to condemn nearly five miles of roadway. Courts have held street cars to be an "ordinary use." Operation of steam railways through a city street has been held trespassing. To prove that they merely were operating a street car system, interurban officials called the attention of the court to the fact that passengers are carried between points within the city limits, principally to Kensington and Belt Junction, both being beyond the regular car line.

MISCELLANEOUS

Proposed Municipal Golf Course.

Birmingham, Ala.—The campaign for the municipal golf links is nearing an end through the work of a number of committees. The plans have been completed for the course and the clubhouse. The entire city commission is heartily in favor of the movement for the golf and other recreational development of Green Springs and more than a thousand citizens had expressed their approval. The Tennessee Coal,

Iron & Railroad Company has donated the right of way across its Red Mountain property and a fine scenic driveway is planned leading past the proposed golf course. This driveway is shown in the dotted lines in the accompanying map running from St. Charles street (at the right in the map) across the railroad property into the Green Springs park driveway.

The Cities and the High Cost of Living.

Evansville, Ind.—Against powerful opposition from dealers Mayor Benjamin Bosse established a municipal coal yard and a municipal market. City sealer John Wallenmeyer bought 1,600 tons of coal in Kentucky and more in other mine and distribution centres. Delivery to consumer was guaranteed at 12 cents a bushel. The municipal market bought wholesale in Chicago and other places and sold at retail at from 25 per cent to one-third less than prevailing prices. Hogs, potatoes, butter and eggs were sold in this way. Rabbits were sold at 15 cents apiece, instead of 35. A very popular plan was instituted by the mayor—that of bargain days—each day having some specially featured article at low prices.

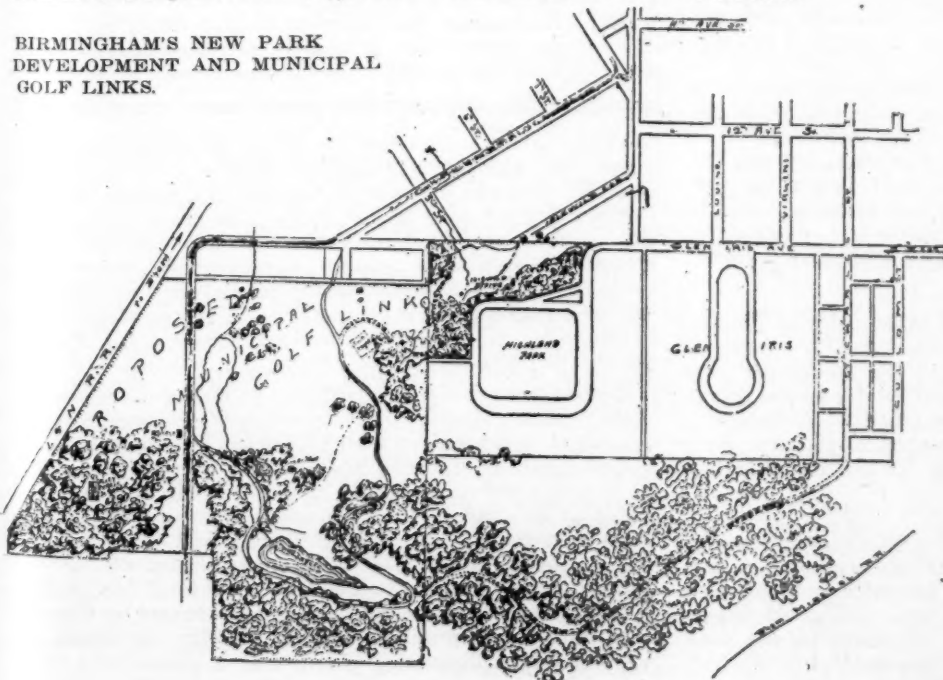
Conneaut, O.—Conneaut was the first city in the state to go into the coal business, but quit after selling seven carloads. The city attempted to bring down prices by eliminating the dealer and bought by the carload to sell at retail. Even though the city sold the coal at what it figured was cost, it made \$42.10 in the business.

Albany, N. Y.—The New York State Conference of Mayors brought into the high cost of living situation a new fighting method—the officially proclaimed boycott. Mayor Cornelius F. Burns, of Troy, as president of the conference, organized the mayors and many of them responded to his suggestion by proclaiming the institution of a state-wide boycott on eggs. Letters were sent out urging the city officials to gain the assistance of the local press, to make an official announcement and to encourage the active co-operation of civic organizations. The two weeks' boycott on eggs is calculated to reduce the high prices and is to be followed by similar campaigns against other staple food products. Mayor Burns has appointed a committee of nine mayors, representing the different classes of cities, to investigate the problems of food costs. The committee consists of George R. Lunn, Schenectady, chairman; John Purroy Mitchel, New York City; Samuel Carlson, Jamestown; Walter R. Stone, Syracuse; D. W. Wilbur, Poughkeepsie; Isaac R. Breen, Watertown; Joseph W. Stevens, Albany; Edward Reed, Glens Falls, and H. H. Edgerton, Rochester.

Following the attack on the problem by the mayors of the state, Governor Charles S. Whitman appointed a committee to prepare remedial measures to be submitted to the legislature in the form of bills and advisory reports. The members of the committee are George W. Perkins, of the Mayor's Committee on Food Supply of New York City; Senator Charles W. Wicks, chairman of the joint legislative committee now making a state-wide investigation of the milk and dairy industry; S. J. Lowell, master of the State Grange, and Clifford S. Sims, vice-president of the Delaware & Hudson Railroad.

New York, N. Y.—While the high cost of living problem has been greatly agitated and discussed by citizens and city officials no actual attempt to help reduce food costs has been attempted. Following investigation by commissioner of ac-

BIRMINGHAM'S NEW PARK DEVELOPMENT AND MUNICIPAL GOLF LINKS.



counts Leonard M. Wallstein, Mayor Mitchel announced that he was ready, on two days' notice, to establish a municipal coal market to serve the poor, the city's garbage wagons being used for delivery. The prevailing price of coal is said to have declined slightly at once and the mayor's threat has not been carried out. Commissioner of weights and measures Joseph Hartigan organized his inspectors in a continuous investigation of prices and food storage conditions in the city and is ready to take active measures against any illegal action on the part of the food handlers. The commissioner is cooperating with the state mayors' conference and local women's organizations. State commissioner of foods and markets John J. Dillon has made his headquarters in New York city and is working vigorously for lower prices. He is urging the construction of a \$3,000,000 city market and the improvement of terminal facilities. He has helped organize the farmers and expects to be able to force the price of milk down to 8 cents through the farmers' cooperative pasteurization plants which he helped establish. The Wicks legislative committee, which has been holding hearings in the city, has brought out some interesting facts and proposals. The most important is that the city be divided into territories and one milk company be given a monopoly franchise to cover the distribution in each area—as in the case of the gas and electric utilities. The saving for one company alone was estimated to be \$40,000 a year under this plan.

Columbus, O.—Councilmen Lamneck and Zimpfer are considering the report of a survey made by Edwin Spencer, of Ohio State University, on market conditions in relation to the production of vegetables in the local community. The report finds that there are at least 450 local gardeners and farmers who sell vegetable products in the city. Of these 118 were investigated in detail for the survey. It was found that 49.2 per cent sell on the wholesale market to commission men, grocers, jobbers and wagon men. This wholesale market has developed rapidly in the last few years, the report finds. To improve conditions the investigator suggests the extension and better regulation of the present market zone; to make market space available for gardeners; to build a wholesale market house; and to license certain street curbs for market purposes.

Chicago, Ill.—National interest in the food problem has tended to center on Chicago as the investigations of the federal officials have uncovered considerable improper handling of food supplies on a large scale. Perhaps the one incident of the present agitation that gained most general publicity has been the diet experiment of health commissioner John Dill Robertson. Six men and six women, health department employees, performed a carefully controlled experiment for two weeks, during which they ate only meals scientifically planned for maximum nutritional values and minimum cost, consistent with appetizing flavor. The cost of the food of each member of the group has been a little over thirty cents a day and the dieters gained on an average 3.80 pounds during the two weeks. Dr. Robertson states that his intention in conducting the experiment was to help demonstrate popularly the oft-explained results of the study of dietetics and household economies.

Springfield, Ill.—Mayors of about forty cities in Illinois are now meeting here to consider the possible means of securing a reduction in coal prices. The conference was arranged by Mayor A. K. Abbott, of Quincy, at the recent municipal league at Urbana. Mayor Charles W. Baumann has been making a thorough investigation of prices in local grocery stores and has exchanged a list for a similar one with the mayor of Peoria.

Muncie, Ind.—Mayor Rollin H. Bunch encountered vigorous opposition in his establishing of a municipal coal yard. He sold out his first supply of coal and found himself without any other source. Council passed an appropriation of \$15,000 for operation of the yard, but the dealers threatened to bring injunction proceedings if the city

LEGAL NOTES

A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

Notice of Sidewalk Improvement—Sufficiency.

(Miss.) Where notice of sidewalk improvement in D. was published in a paper published at L., notice was insufficient, under Laws 1912, c. 260, §§ 6, 7, though the paper had general circulation in D.—*Langstaff v. Town of Durant*, 72 So. 236.

Destruction of Trees or Shrubbery—Injunction.

(N. Y. Sup.) If persons seek to destroy trees or shrubbery in the parkway in a city street, without authority from the city, an abutting owner may have redress by enjoining threatened acts.—*Kingsley v. Pounds*, 160 N. Y. S. 228.

Street Ordinance—Judicial Powers.

(Ind. App.) An ordinance regulating a street is a legislative act, entirely beyond the control of the judicial power of the state.—*Windle v. City of Valparaiso*, 113 U. E. 429.

Extending Electric Plant—Power of City.

(Ga.) A municipality, authorized to erect and operate an electric lighting plant and to acquire property beyond its limits for corporate purposes, may without exceeding its authority construct a line of poles and wires to property so acquired, outside of its limits, to carry electric current to the town.—*Town of Mansfield v. Cofer*, 89 S. E. 410.

City Milk Regulation—Conflict—Validity.

(Conn.) A city regulation prohibiting the sale of milk in stores, etc., unless kept in sealed bottles, does not conflict with Pub. Acts 1911, c. 221, fixing a milk standard, penalizing the placing of certain substances in milk containers, and defining impure milk.—*State v. Stokes*, 98 A. 294.

Action for Injuries—Limitations.

(Wash.) Under City Charter of Spokane, art. 12, § 115, requiring notice of claim, in an action for personal injuries received upon a sidewalk from ice and cinders thrown there, by the firemen when washing fire wagon at the station, city being charged with negligence independent of the ice and snow, the 30-day limitation for the presentation of claims is the controlling clause.—*Taylor v. City of Spokane*, 158 P. 478.

Engineer's Estimate—Detail Required.

(Neb.) In making estimation of cost of street pavement, city engineer need not separately estimate cost of each item.—*Wurdeman v. City of Columbus*, 158 N. W. 924.

treasurer attempted to use the money in competition with them. The city received coal for \$4.10 per ton and sold it at \$4.50, 40 cents being paid for delivery in city wagons. Dealers retailed their coal at \$6.50. The dealers in the city and nearby centres organized to fight any attempt of the mayor to get a new supply. A number of dealers canceled advertising contracts with local newspapers because the papers had given good publicity to the municipal yard. In this way the dealers attempted to direct public opinion against the mayor's project.

Terre Haute, Ind.—Aroused by the high coal prices prevailing Mayor James Gossom decided to lower them by municipal competition after warning the dealers. The mayor established a city coal market where he sold at \$2.75 a ton the same grade of coal which was being retailed at \$6. He hired 200 wagons to transport the coal from the source to the market. In the first day of business the mayor received 3,000 orders, practically all of them calling for the limit of two and one-half tons. In order to insure a permanent supply the mayor leased a fifty-acre coal tract for strip mining west of the city and within convenient wagon distance.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals.

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS.

State:

Distribution of 1915 Expenditures of State Highway Departments. 1 ill., 500 words. Engineering and Contracting, Nov. 1. 10 cts.

Virginia Road Work. A review of the work done during 1916 by state and state aid forces. By G. P. Coleman, State Highway Commissioner. 3 ill., 3,000 words. Good Roads, Nov. 4. 10 cts.

A Review of West Virginia Highway Work. Describes the organization of the state highway department, the work done during the past year and methods of construction. By A. D. Williams, Chief Road Engineer. 8 ill., 2,500 words. Good Roads, Nov. 4. 10 cts.

Highway Conditions in Pioneer Good-Roads States Unsatisfactory. New Jersey, after spending \$100,000,000, has inadequate system, inefficiently administered. 3,200 words. Engineering Record, Nov. 18. 15 cts.

Convict:

State Convict Work in Oklahoma. Information furnished by the State Highway Department in regard to the work done at the various camps during the past year. 2,000 words. Better Roads and Streets, Nov. 15 cts.

Construction:

Alignment and Drainage of Rural Highways. Description of small details essential to successful highway construction, but frequently neglected. Simple means of rendering grade crossings less dangerous, and the essentials of alignment to insure surface drainage. By H. E. Bilger, Illinois State Highway Department. 1 ill., 2,500 words. Engineering News, Nov. 9. 15 cts.

Developments in Road Construction. Government reports disclose developments brought about by increased motor traffic in New York, New Jersey and Pennsylvania. 1,200 words. Municipal Journal, Nov. 16. 10 cts.

Special Problems in Drainage. Gives seven rules for road drainage. By A. M. Kemp. 4,000 words. Municipal World, Nov. 20 cts.

Road Building Methods of New York State Criticized; Deputy Commissioners Reply. D. T. Pierce criticizes methods; H. E. Breed and F. W. Sarr take issue with his statements. 3,500 words. Engineering Record, Nov. 25. 15 cts.

Maintenance:

Fundamental Necessities in the Management and Unkeep of Streets and Roads. From a paper by Will P. Blair and discussion by members of the society. 13 pages. Journal of the Cleveland Engineering Society, Nov. 35 cts.

Portable Plant Makes Bituminous Pavement Patches. Recent street repair work in Charlotte, North Carolina, cost 60 cents per square yard. By Samuel H. Lea, City Engineer. 1 ill., 800 words. Engineering Record, Nov. 4. 15 cts.

Maintaining Concrete Roads in Illinois. Methods and cost of maintenance for Illinois roads during 1915. 2 ill., 2,000 words. Cement, Nov. 20 cts.

The Maintenance of Brick Pavements. Describes some of the methods that produce best results in case of failure of any part of a brick pavement. By C. C. Brown. 7 ill., 7,000 words. Municipal Engineering, Nov. 25 cts.

Road Maintenance in Cumberland. Resurfacing work. By William Finch, Co. Surveyor. The Surveyor, Nov. 3. 40 cts.

Main Road Maintenance in Kent. Costs and methods. 1,000 words. The Surveyor, Nov. 17. 40 cts.

Surfacing Old Brick Pavement with Sheet Asphalt. Methods and costs in Columbus, Ohio. 1,100 words. Engineering and Contracting, Nov. 1. 10 cts.

Pavements:

Paving by Direct Labor vs. Contract Work. Points in favor of each kind of construction arranged opposite each other for convenience of comparison. By

C. A. Mullen. 1,500 words. Municipal Engineering, Nov. 25 cts.

Experience in Paving Roads of a Washington County. Remarks on various types of pavement, methods of laying, etc. Gravel and earth roads. By D. H. White, county engineer. 2,000 words. Engineering News, Nov. 2. 15 cts.

Asphalt:

A. S. M. I. Sheet Asphalt Specifications. A letter from Francis P. Smith. 1,750 words. Municipal Journal, Nov. 9. 10 cts.

Requiring Sheet Asphalt Pavement Between Car Tracks. Methods employed by Milwaukee Street Railway Company. By Stanley E. Bates. 1,000 words. The Contractor, Nov. 1. 20 cts.

Portable Asphalt Plants for Country Roads and City Streets. The second in a series of articles. This describes the two unit plant and also the three unit plant. Capacity, operation and cost of operation. By George D. Steele. 6 ill., 4,000 words. Better Roads and Streets, Nov. 15 cts.

Bituminous:

Bituminous Concrete Paving in Montclair. Adjusting a street to a steep side hill. Steam shovel work in shallow excavating. Concrete and bituminous top. 1 ill., 3,000 words. Municipal Journal, Nov. 30. 10 cts.

Brick:

Monolithic Brick Paving for Wide Streets. Practice on some new street work in Marshall, Ill. By Wm. Robert Paige. 2 ill., 1,800 words. Engineering News, Nov. 23. 15 cts.

Monolithic Brick Pavements in Cities. Experiences with this type of construction in Wichita. Changes in the method to adapt it to municipal conditions. By P. L. Brockway, Assistant City Engr. 1,500 words. Municipal Journal, Nov. 9. 10 cts.

Specifications for Reconstruction of Vitrified Brick Country Roads. Green concrete foundation and cement grout filler. 7 ill., 3,000 words. Better Roads and Streets, Nov. 15 cts.

Concrete:

New Concrete Pavement in White Plains. Type of construction new in the east in which concrete is consolidated by the use of a vibrator. Details of construction. By J. S. Crandell. 3 ill., 1,250 words. Municipal Journal, Nov. 30. 10 cts.

New Method of Surfacing Concrete. Rolling with long handled roller and dragging with garden hose, substituted for hand floating in Americus, Ga. Other construction details. 2 ill., 1,000 words. Municipal Journal, Nov. 16. 10 cts.

More Details of Sioux City Concrete Paving Practice. Gives an analysis of the procedure and describes details fully. 1,000 words. Engineering News, Nov. 2. 15 cts.

Canvas Belt for Finishing Concrete Road Reduced Cost. By D. A. Thomas. 1 ill., 750 words. Engineering and Contracting, Nov. 1. 10 cts.

Begin Studies to Find Cause of Concrete Road Cracks. Periodic measurements to be made of vertical movement of pavement slabs at Kenilworth, Ill. By William Kinney. 1,000 words. Engineering Record, Nov. 18. 15 cts.

A Low Cost Reinforced Concrete Pavement Was Laid in Joplin, Mo., at a cost of \$1.18½ per sq. yd. complete. 2 ill., 1,000 words. Engineering and Contracting, Nov. 1. 10 cts.

Granite:

The Making of Granite Paving Blocks. Method of manufacture. 1,000 words. Stone, Nov. 15 cts.

Macadam:

Maintenance of Macadam Road with Bituminous Binders. A summary of experience on a division of the New York State highway department with recommendation of practice. 5 ill., 3,600 words. By T. M. Ringley. Engineering News, Nov. 30. 15 cts.

Oiling:

Arizona Experiments with Oiling of Roads. Method of applying and cost. 600 words. Engineering Record, Nov. 11. 15 cts.

Sand-Oil Roads in Mass. Method of construction of road developed in Mass. and which, despite its low cost, has been very successful. By W. R. Farrington, Division Engineer. 3 ill., 3,000 words. Good Roads, Nov. 4. 10 cts.

Sand and Asphaltic Oil Roads of Massachusetts. Method of construction, cost and maintenance. Materials. 2,800 words. Engineering and Contracting, Nov. 1. 10 cts.

Wood Block:

Wood Block Paving Specifications. Report of special committee to A. S. M. I., outlining progress in securing standard specifications, and submitting a proposed specification. 4,500 words. Canadian Engineer, Nov. 9. 15 cts.

Miscellaneous:

Pavement Destruction by Heavy Trailers. Five or six tons on one steel tire pulverized asphalt and stone block pavement. Stiff springs and high speed are important factors. Laws for regulating vehicles are discussed. From a paper by E. W. Stern, chief engineer of highways, Manhattan Borough, N. Y. 3 ill., 1,500 words. Municipal Journal, Nov. 2. 10 cts.

Railway Uses Old Sandstone Block for Paving Foundation. Covered with concrete - rout they are used as a base for brick or other pavement. 2 ill., 600 words. Electric Railway Journal, Oct. 28. 10 cts.

Laboratory Test - for Road Building Material. Action of traffic on macadam, toughness of rock, tests and standard bridge, culvert and abutment plans. 1,200 words. Canadian Engineer, Nov. 9. 15 cts.

Control of Highway Work by Means of Planning Boards and Current Status Visible Records. By William H. Connell. 8 ill., 1,500 words. American City, Nov. 50 cts.

Examination Questions for County Road Engineers in Kentucky. 750 words. Engineering and Contracting, Nov. 1. 10 cts.

Future of Granite, Macadam and Concrete Roads. By H. P. Boulnois. 1,250 words. The Surveyor, Nov. 17. 40 cts.

Reduction of High Grade. Relocation is often desirable to steep grades. By J. Duchastel. 700 words. Canadian Engineer, Nov. 23. 15 cts.

Back Filling Trenches with a Road Grader. Methods and cost. By W. E. Voorhees. 1 ill., 750 words. Engineering Contracting, Nov. 8. 10 cts.

Report of the Committee on Street Paving of the Present Practice Regarding Replacement of Cuts in Pavements. 12,000 words. Better Roads and Streets, Nov. 15 cts.

Notes on Cartwheels and Tires. Information with reference to damage to road from various kinds of tires, springless wheels, etc. By T. Salkield. 6 ill., 1,200 words. The Surveyor, Nov. 10. 40 cts.

An Accounting System for Township and District Road Officials. 7 ill., 1,000 words. Engineering and Contracting, Nov. 29. 10 cts.

The Wheelway Automobile Drive. By W. H. Manning. 6 ill., 1,200 words. American City, Nov. 50 cts.

Combination Sewer and Street Pavement Base. Plans and details. 2 ill., 500 words. Engineering and Contracting, Nov. 8. 10 cts.

SEWERAGE AND SANITATION.

Treatment:

Results and Conclusions from a year's Operation of the Activated Sludge Sewerage Plant at Milwaukee. 4,000 words. Engineering and Contracting, Nov. 8. 10 cts.

Digestion of Activated Sludge. An account of investigations carried out to

ascertain which process is most practicable, trickling filters or activated sludge plants, in the treatment of industrial wastes. By H. P. Eddy. 4,000 words. Canadian Engineer, Nov. 2. 15 cts.

Activated Sludge Novelities at Hermosa Beach, Cal. A diffuser wheel will take the place of diffuser blocks and will suck air down a central pipe. Air under 1 lb. pressure will also be used. By A. M. Brosius. 2 ills., 1,400 words. Engineering News, Nov. 9. 15 cts.

Activated Sludge Experiments at the University of Illinois. Summary of four sets of experiments with some details of the Champaign tank converted for activated sludge experiments. By Edward Bartow, F. W. Mohlman and J. F. Schnellbach. 1 ill., 1,100 words. Engineering News, Nov. 23. 15 cts.

The Activated Sludge Process. Information issued by the Manchester Rivers Committee. 1,500 words. The Surveyor, Oct. 27. 40 cts.

Finds Electrolytic Sewage Treatment Little Better Than Lime Alone. Test at Decatur plant discontinued and outfit dismantled. By Edward Bartow. 1,200 words. Engineering Record, Nov. 11. 15 cts.

Sewage Disposal at Leeds. Analyses and working costs; treatment during the past year; trade effluent treatment. 3,000 words. Surveyor, Nov. 17. 40 cts.

Recommend Isolated Sewage Treatment Plants for Lake Cities North of Chicago. Sewage should be treated before turned into lake. 1,800 words. Engineering Record, Nov. 25. 15 cts.

Disposal of Domestic Wastes. By F. A. Dallyn, Sanitary Engineer, Province of Ontario. 3,000 words. Municipal World, Nov. 20. 20 cts.

Operation of Sewage Disposal Plants. Importance and methods of learning of amount to be treated. Control by State Health Boards of operation as well as construction. 2,250 words. Municipal Journal, Nov. 30. 10 cts.

Urges Skilled Operation of Sewage Works. State supervision is endorsed. 1,200 words. Engineering Record, Nov. 11. 15 cts.

Reports on Year's Operation of Fitchburg Sewage Works. Experiences in the maintenance of Imhoff tanks and sprinkling filter. By E. W. Jones, Chemist. 2,000 words. Engineering Record, Nov. 4. 15 cts.

Operation of Baltimore Sewage Disposal Plant. Facts and figures concerning the building and operation of the plant, changes made since 1913, performance since then and maintenance and operation costs for the year. From a paper by G. J. Requardt. 1 ill., 3,500 words. Municipal Journal, Nov. 2. 10 cts.

Plants:
Imhoff Tanks and Sprinkling Filters at Cleburne, Texas. The design of Imhoff tanks is shown with unusual fullness, both as to arrangement of parts and concrete reinforcement. By R. E. McDonnell. 4 ills., 1,300 words. Engineering News, Nov. 30. 15 cts.

Slaughter-House Sewage Test Plant, Buenos Aires. Describes the test plant, methods of operation, and results. Analyses of sewage and effluent. By W. S. Coulter. 1,250 words. Engineering News, Nov. 2. 15 cts.

Pumping:
The Spring Lake Drainage and Levee District. Substitution of electric drive for steam drive for pumping has been very satisfactory, especially in regard to cost and freedom from interruption. 2 ills., 1,200 words. Electrical Review, Oct. 28. 10 cts.

Sewers:
Chicago's Norwood Park Sewer. Touches on points of value to the engineer and contractor. Methods of construction. 4 ills., 2,500 words. Municipal Engineering, Nov. 25 cts.

Construction of Dyckman Street Sewer Outlet New York. Sanitary Tile sewer built in rock cut. Reinforced concrete storm overflow sewer built in successive steel sheet pile cofferdams. Contracting, Nov. 10 cts.

Unlined Sewer Tunnel in Rock at Rochester. Describes construction of tunnel about 33 feet below street level. By C. L. Raymond. 2 ills., 800 words. Engineering News, Nov. 9. 15 cts.

First Tile Sewers in St. Louis Compared to Brick. Bids asked for either brick or tile, the latter being accepted because of lower cost. Excellent comparison of brick and tile construction. By Ben Moreell. 4 ills., 2,400 words. Engineering News, Nov. 30. 15 cts.

A Novel Reinforced Concrete Sewer Viaduct. Was recently constructed in

Duluth, Minn. By F. C. Perkins. 2 ills., 1,000 words. Engineering & Contracting, Nov. 8. 10 cts.

Vitrified Pipe with Asphaltic Joints Used as Force Main. John B. Hawley describes results of test on pressure line in Texas sewerage system. 1,250 words. Engineering Record, Nov. 18. 15 cts.

Miscellaneous:
Sanitation on the Rockaway River Watershed. Describes the watershed from which Jersey City draws its supply and discusses the difficulty of patrolling the supply area. By C. F. Breitzke. 2,500 words. Fire and Water Engineering, Nov. 15. 10 cts.

Reaeration Held to Be Important in Self Purification of Streams. Prof. Phelps contends that dilution ratio is not the essential factor in preventing nuisances. 2,000 words. Engineering Record, Nov. 18. 15 cts.

Proposed Code for the Sanitary Control of Waterways. Portion of report of Committee of Sanitary Section of American Health Association. 830 words. Engineering News, Nov. 9. 15 cts.

WATER SUPPLY.

Waterworks:
The New Water Supply and Other Municipal Works at Watford. Describes in detail the waterworks system and pumping plant and the methods of purification; sewerage treatment and paving. 29 pages. Illustrated. Journal of Municipal and County Engineers, Nov. 65 cts.

The Waterworks system at Haverhill. Description of the system and its operation. 1,200 words. Fire and Water Engineering, Nov. 1. 10 cts.

The Development of Cleveland's Water System. A complete history of the development to the present day. By C. F. Schultz. 27 ills., 24 pages. Journal of the Cleveland Engineering Society, Nov. 35 cts.

New Westminster Water Works Construction. Designs, materials and methods used in obtaining pure water supply. Laying 12-in., 18-in. and 25-in. steel water mains. By J. W. B. Blackman. 11 ills., 10,000 words. Canadian Engineer, Nov. 23. 15 cts.

Gravity Water Supply Scheme for Calgary. Abstract of report recommending gravity extension with sedimentation reservoir, total cost to be about \$380,000. By G. W. Craig, city engineer. 2 ills., 1,500 words. Canadian Engineer, Nov. 16. 15 cts. 2,600 words. Nov. 23. 15 cts.

Water Supply of the City of Port Arthur. General description of intake pipes, pump house equipment and force main. By L. M. Jones, chief engineer. 4 ills., 500 words. Canadian Engineer, Nov. 9. 15 cts.

Repairing Flood Damage to San Diego Water System. Methods adopted for securing and safeguarding an emergency supply while replacing dam and pipe lines carried away by flood of last January. Using old pipe. Overcoming transportation difficulties. By A. C. Francis. 3 ills., 3,000 words. Municipal Journal, Nov. 30. 10 cts.

Water Works Improvements at Sioux Falls, S. Dak. The new reservoir has novel floor construction and interior wells as its interesting features. The new pumping plant is operated by oil engines that also drive electric generators. 4 ills., 2,000 words. Engineering News, Nov. 2. 15 cts.

Purification:
Disinfection and other Progress in Municipal Water Supply. Abstract of report of committee of American Public Health Association. 1,500 words. Canadian Engineer, Nov. 23. 15 cts.

Periods of Filter Service Increased 250 per cent. Modified methods of operation effect marked economies at Cincinnati plant. 3 ills., 1,750 words. Engineering Record, Nov. 25. 15 cts.

Operation of St. Louis Filters. Report of the operation for the first year of the largest rapid filter plant. Clarification by precipitation, operation details and cost and difficulty of piping chlorine water. Unslakable materials in the lime. 3 ills., 4,000 words. Municipal Journal, Nov. 9. 10 cts.

Treatment of Missouri River Water at Council Bluffs. Method of purification and results obtained. By J. B. Thornell, Chemist. 1,200 words. Fire and Water Engineering, Nov. 8. 10 cts.

Change from Alum to Iron at Clarksburg Water Filters. High cost of coagulant reduced, and some noteworthy results. By Perkins Boynton. 900 words.

Engineering News, Nov. 16. 15 cts.

Pipe Lines:
Winnipeg-Shoal Lake Aqueduct Construction. Location, design, construction methods and features of \$13,000,000 gravity pipe line that will supply Winnipeg water district with 80,000,000 gallons daily. 9 ills., 7,500 words. Canadian Engineer, Nov. 16. 15 cts.

Engineers Condemn Montreal Aqueduct Scheme. Investigating committee advises city to abandon the project. 5,000 words. Canadian Engineer, Nov. 23. 15 cts.

Breaks in Cast Iron Pipe Lines. Three suggestions for adequate inspection as prevention for breaks. By R. D. French. 1,000 words. Canadian Engineer, Nov. 16. 15 cts.

Reservoirs:
The Evolution of the Water Tank. Describes the steps in the development of the modern type. 2 ills., 1,200 words. Fire and Water Engineering, Nov. 15. 10 cts.

Six Post Water Tower Tank. The design and erection at Wheaton, Ill., of a steel water tower and tank, having a total height of 173 feet, are described. 4 ills., 1,600 words. Engineering News, Nov. 9. 15 cts.

Design Features of Lansing, Michigan, Reinforced Concrete Reservoirs. 1 ill., 1,500 words. Engineering & Contracting, Nov. 8. 10 cts.

Building Concrete Reservoirs Without Forms. Cement gun concrete on wire mesh, which is used for reinforcing. 2 ills., 400 words. Engineering News, Nov. 9. 15 cts.

Pumping:
Electricity in Municipal Pumping Plants. Because of the characteristics of the load, the city pumping plants can economically purchase all the power required. Experiences of Texas communities are described. 5 ills., 3,000 words. Electrical Review, Nov. 25. 10 cts.

More Data on Tests of Montreal Centrifugal Pump. By A. Peterson. 3,000 words. Engineering News, Nov. 2. 15 cts.

Meterage and Waste:
Water Losses in a City System. Abstract of a discussion before the New England Water Works Association. By F. A. Barbour. 1,750 words. Engineering News, Nov. 6. 15 cts.

Committee Wants Data on Pipe and Joint Leakage to Check \$4,000,000 Annual Loss. Excess of water waste might be reduced by better methods of construction. 1,700 words. Engineering Record, Nov. 18. 15 cts.

Finding Leaks and Weaknesses in Baltimore Water Mains. 400 words. Engineering News, Nov. 23. 15 cts.

Chicago Wastes 60 per cent of Water Supply. Universal installation of meters is considered the only method of solving the problem. 4,500 words. Water and Gas Review, Sept. 20 cts.

Setting Meters at Terre Haute. By J. A. Cravens, Asst. Superintendent. 1 ill., 1,500 words. Fire and Water Engineering, Nov. 1. 10 cts.

Cost of Meter Maintenance and Repair in Chicago. 1,000 words. Engineering and Contracting, Nov. 8. 10 cts.

Miscellaneous:
Filter Patent Claims Invalid. Minneapolis wins suit against I. H. Jewell involving equipment of mechanical filter plant. 1,100 words. Engineering Record, Nov. 11. 15 cts.

Simple Machine Lowers Cost of Pipe Bending. 1 ill., 700 words. American Gas Light Journal, Nov. 13. 10 cts.

Standard Specifications for Hydrants and Valves. Suggested by Committee of the American Water Works Association. 1,500 words. Canadian Engineer, Nov. 2. 15 cts.

Cast-Iron Manufacturing in the South. By Y. A. Dyer. 7 ills., 1,500 words. Iron Age, Nov. 23. 20 cts.

LIGHTING AND POWER.

Street Lighting:
Effect of the Type "C" Lamp on Public Street Lighting. Data are derived from a thickly populated section. During the eight years considered in the paper, total revenue from street lighting has increased 33 per cent; and this increase has been secured during a period when the efficiency of lamps has been greatly improved. By John West. 2 ills., 3,000 words. General Electric Review, Dec. 20 cts.

Installing Lighting Plants in Small Villages. How to secure profitable business from the installation of small plants in towns and villages. By W. A.

Magee. 3,000 words. Electrical Review, Nov. 11. 10 cts.

Cleveland Ornamental Street Lighting. In designing the installation, special attention was given to the light distribution from the unit to reduce the glare as much as possible without sacrificing efficiency. By Ward Harrison. 3 1/2 ills., 3,500 words. Lighting Journal, Nov. 10 cts.

Economical Control for Decorative Street Lighting at Madison, Wis. 3 1/2 ills., 1,200 words. Electrical Review, Nov. 11. 10 cts.

Some Details of the New Street Lighting System of Pocatello, Idaho. 7 1/2 ills., 1,200 words. Engineering & Contracting, Nov. 22. 10 cts.

Power Plants:

Heavy Oil Engines. A comparative study of the efficiency of low compression and high compression or Diesel type engines. 1,500 words. Canadian Engineer, Nov. 2. 15 cts.

Engineers Condemn Montreal Municipal Power Plant. Voluntary commission of local engineers reports that proposed municipal water power plant is ill-advised. 1 1/2 ills., 2,100 words. Engineering News, Nov. 30. 15 cts.

Miscellaneous:

Poor Service Causes Municipal Ownership. Customers of a public utility demand and are willing to pay for good service and if the private company does not give it, municipal ownership will be considered. By Glen Marston. 3,500 words. Electrical Review, Nov. 4. 10 cts.

Developments in Meter Testing Methods and Apparatus. Improvements on early method of testing has developed a method that is used for all classes of meters. By O. A. Knopp. 15 1/2 ills., 5,000 words. Electrical World, Nov. 11. 10 cts.

FIRE.

Protection:

Fire Department Data. General information concerning the fire department of more than 700 cities. Gives area protected, appropriation and first alarm area. 3 1/2 pages. Municipal Journal, Nov. 9. 10 cts.

Fire Department Statistics. Figures from several hundred cities concerning expenditures, area and number of buildings protected and areas covered by automobile apparatus. 4 pages. Municipal Journal, Nov. 16. 10 cts.

Standardization of Fire Protection. Steps include improvement in building construction, creating the office of fire marshal, educating the people and raising the standards of municipal fire departments. By J. G. Smith. 1,250 words. Fireman's Herald, Nov. 11. 5 cts.

Practical Fire Fighting. Questions asked in a New York Fire Department examination with answers. Fireman's Herald, Oct. 28. 1 1/2 ills., 1,200 words; Nov. 4, 800 words; Nov. 11, 1,000 words; Nov. 18, 1,000 words; Nov. 25, 1,200 words. 5 cts. each.

Fire Protection in Gloucester. From the report of the national board of fire underwriters. 1,800 words. Fire and Water Engineering, Nov. 8. 10 cts.

Fire Department of Wichita. Department is well organized and effective. 1 1/2 ills., 1,200 words. Fireman's Herald, Nov. 5. 5 cts.

San Francisco Fire Department. Report by New York Bureau of Municipal Research. 1,800 words. Fireman's Herald, Nov. 4. 5 cts.

Motor Apparatus:

Motorizing a Small Town Fire Department. By George T. Mohrbacher. 1,600 words. American City, Nov. 50 cts.

Miscellaneous:

Standardization of Hose Couplings. Fire Chiefs' Association will conduct an educational campaign. 1,000 words. Fire Protection, October. 15 cts.

Importance of Drill Schools. Benefits that accrue from technical and physical training of men and officers. By A. H. Strong. 1,200 words. Fireman's Herald, Nov. 18. 5 cts.

More Platoon Departments. A list of the cities which have adopted the two-platoon system. 1,000 words. Fireman's Herald, Nov. 18. 5 cts.

Civil Service as an Agency of State Fire Marshal Department Efficiency. By William Guerin. 1,800 words. Fire and Water Engineering, Nov. 22. 10 cts.

Inspecting a City's Fire Hazards. Main purpose of inspections by the state fire marshal is to encourage the local departments to do the work. By F. R. Morgaridge. 1,000 words. Fireman's Herald, Nov. 25. 5 cts.

MOTOR VEHICLES.

Operation:

Economics and Cost of Motor Truck Operation. First cost and operating cost of gasoline motor truck; table of costs at various daily mileages; comparison with horse-drawn vehicles. By W. H. Clapp. 5 1/2 ills., 4,000 words. Canadian Engineer, Nov. 9. 15 cts.

Motor Truck Operation in Southern California. Contains much data of value to truck owners as a check on their present operating costs. 5 1/2 ills., 3,000 words. Concrete, November. 20 cts.

Electric Vehicle Trial at Manchester. Conditions of the test, operating cost and comparison with horse hauling. 1 1/2 ills., 4,000 words. By S. L. Pearce. The Surveyor, Oct. 20. 40 cts.

Equipping Motor Trucks for Central Station Service. How electric service companies are equipping trucks for lamp installation, maintenance and trouble shooting service. 12 1/2 ills., 2,500 words. Electrical World, Nov. 4. 10 cts.

Horses or Motors for Collecting City Garbage. An investigation of the methods of collection in 125 cities of which 105 are still using horse-drawn apparatus. By B. F. Miller, Jr. 1,700 words. Engineering News, Nov. 23. 15 cts.

Legislation:

Motor Truck Legislation Advocated in Michigan. Bill restricting weight, size and speed of truck is prepared by county commissioners. Provisions, 1,200 words. Engineering Record, Nov. 11. 15 cts.

Proposed New Jersey Vehicle Law. Contemplated provisions for law to regulate motor traffic. 1,000 words. Municipal Journal, Nov. 2. 10 cts.

Necessity for Limiting the Loads, Size and Speed for Vehicles. Describes damage to New York pavement by heavy trucks and trailers. 3 1/2 ills., 2,000 words. Engineering & Contracting, Nov. 1. 10 cts.

Miscellaneous:

A Directory of Motor Truck Makers. Includes technical specifications for electric and gasoline trucks for 1917. 26 pages. Commercial Vehicle, Nov. 1. 20 cts.

Technical Specifications. Names of Makers and Prices of Commercial Vehicles. 20 pages. The Automobile Nov. 2. 10 cts.

Automobile License Numbers. A plan to substitute letters for figures and thus reduce the number of characters on each plate. 1,000 words. Municipal Journal Nov. 2. 10 cts.

STREET CLEANING AND REFUSE DISPOSAL.

Street Cleaning:

Functional versus Geographical Plan of Organization. Refers particularly to street cleaning department organization. Functional plan results in better administrative control but there are objections to it. By T. L. Hinckley chief bureau of municipal research, Toronto. 2 1/2 ills., 2,000 words. Canadian Engineer, Nov. 9. 15 cts.

Street Cleaning Data. Information furnished by officials in charge of this work in about 70 cities. Kind and numbers of apparatus used, amount of cleaning done, and sweepings collected and costs. 6 pages. Municipal Journal, Nov. 23. 25 cts.

Street Cleaning in Savannah. Necessity of stating conditions affecting work in giving cost data. Benefits of cost keeping. Methods and costs in Savannah. 2,500 words. Municipal Journal, Nov. 23. 25 cts.

Street Cleaning Methods. Reports from 38 cities giving methods employed by each and methods recommended for cities of 15,000 to 50,000. 1,700 words. Municipal Journal, Nov. 23. 25 cts.

Selection, Training and Care of the Horse for Street Cleaning Work. 4,500 words. Engineering and Contracting, Nov. 1. 10 cts.

Society for Street Cleaning and Refuse Disposal of the United States and Canada. Account of meeting and abstract of some papers. 4,500 words. Municipal Journal, Nov. 23. 25 cts.

Some Costs of Flushing and Scrubbing Paved Streets in St. Paul, Minn. 750 words. Engineering & Contracting, Nov. 1. 10 cts.

Trolley Car Street Flushing. Description of method used in Worcester, Mass., and advantages as compared with sprinkling and sweeping. Amount of water used and cost. By A. T. Rhodes, Street Commissioner. 3 1/2 ills., 2,000 words. Municipal Journal, Nov. 23. 25 cts.

Refuse Disposal:

Motor Refuse Collection in New York. Experiences in the model district with

a new combined garbage, ash and rubbish collector. Work done by each collector and cost. Tractors can be used for snow plows also. By C. L. Edholm. 5 1/2 ills., 1,750 words. Municipal Journal, Nov. 23. 25 cts.

Garbage Reduction Plant for New York City. Details of construction of plant which, with a capacity of 2,000 tons a day, will be the largest in the world. 2,250 words. Municipal Journal, Nov. 9. 10 cts.

Garbage Disposal and Collection in Sewickley, Pa. From a paper by E. E. Duff, Jr., city engineer. 2,000 words. Engineering & Contracting, Nov. 8. 10 cts.

Snow Removal:

Removal of Snow in Parks. Problems and methods. By H. S. Richards. 2 1/2 ills., 2,500 words. Municipal Engineering, November. 25 cts.

CITY PLANNING.

How Kenosha is Solving Its Housing Problem. By Alfred F. Muller. 2 1/2 ills., 1,500 words. American City, November. 50 cts.

Playgrounds in Parks from the Designer's Standpoint. By Frederick Law Olmstead. 2,000 words. American City, November. 50 cts.

Town Planning Legislation. By Thos. Adams. 7,000 words. Municipal World, November. 20 cts.

GOVERNMENT AND FINANCE.

City Management: An Opportunity for Engineers. Accounts by managers from Jackson, Mich.; Morris, Minn.; Norwood, Mass., and San Jose, Cal. Engineering & Contracting, Nov. 29. 10 cts.

Method of Making Drainage and Improvement Assessments. Suggestions for appraisal work in drainage and similar improvement districts. By Percy A. Cupper. 1,100 words. Engineering News, Nov. 23. 15 cts.

Obsolescence in Appraisals for Rate Making. By C. H. Harshman. 1,750 words. Engineering News, Nov. 2. 15 cts.

How to Conduct a Bond Campaign. Describes methods of impressing on voters the needs for improvements. From a paper by R. E. McDonnell. 2,000 words. Engineering & Contracting, Nov. 1. 10 cts.

Is Utility Regulation on the Right Basis? Competition is needed. No commission should be empowered to stop anyone from entering into any business. By J. D. Galloway. 4,000 words. Engineering Record, Nov. 4. 15 cts.

Cost Records of Drafting and Engineering. Advantages and methods. 5 1/2 ills., 1,500 words. Engineering & Contracting, Nov. 29. 10 cts.

Cost Keeping Methods for Concrete Construction. 2,500 words. Engineering & Contracting, Nov. 22. 10 cts.

TRAFFIC AND TRANSPORTATION.

Traffic Census Methods and Some Results in St. Louis. Methods of taking an extended traffic census, tabulating and platting data and some of the changes in traffic conditions that were shown; also some statistics of standing vehicles, and the regulation of traffic by ordinance. 6 1/2 ills., 2,000 words. Engineering News, Nov. 2. 15 cts.

Necessity for Limiting the Loads, Speed and Size of Vehicles. The question of damage to pavement by too heavy loads is becoming acute in many municipalities. This article suggests limitations that should be placed on loads and shows the bad effect of exceeding these limits. By E. W. Stern. 5 1/2 ills., 2,500 words. Canadian Engineer, Nov. 2. 15 cts.

Street Traffic Signals. Outlines several methods for signaling street traffic to clear way for fire apparatus. By L. F. Brach. 1,000 words. Fire and Water Engineering, Nov. 8. 10 cts.

Street Traffic Zones and Signals. By John Gillespie. 4 1/2 ills., 2,500 words. American City, Nov. 50 cts.

Illuminating St. Louis Traffic Policemen. On busy corners, flood lights are centered on the traffic policemen. 1 1/2 ills., 500 words. Electrical World, Nov. 25. 10 cts.

New Traffic Code of Columbus, Ohio. Contains a number of interesting re-

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NEWS OF THE SOCIETIES

Calendar of Meetings.

Dec. 13-15.—AMERICAN CIVIC ASSOCIATION. Annual convention, Washington, D. C. Secretary, Richard B. Watrous, Union Trust Building, Washington, D. C.

Dec. 26-28.—SOCIETY OF AMERICAN BACTERIOLOGISTS. Annual meeting, New Haven, Conn. Secretary, Dr. A. Parker Hitchens, Glenolden, Pa.

Dec. 27-30.—AMERICAN ECONOMIC ASSOCIATION. Annual meeting, Columbus, Ohio. Secretary, A. A. Young, Ithaca, N. Y.

Dec. 27-30.—AMERICAN STATISTICAL ASSOCIATION. Annual meeting, Columbus, O. Secretary, Carroll W. Doten, 491 Boylston street, Boston, Mass.

Dec. 26-31.—AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE. Annual meeting, New York City. Secretary, L. O. Howard, Smithsonian Institution, Washington, D. C.

Dec. 28-31.—AMERICAN POLITICAL SCIENCE ASSOCIATION. Annual meeting, Cincinnati, O. Secretary, Chester Lloyd Jones, University of Wisconsin, Madison, Wis.

Jan. 15.—AMERICAN INSTITUTE OF CONSULTING ENGINEERS. Annual meeting, New York, N. Y. Secretary, F. A. Molitor, 35 Nassau Street, New York, N. Y.

Jan. 17-18.—AMERICAN SOCIETY OF CIVIL ENGINEERS. Annual meeting, New York, N. Y. Secretary, Charles Warren Hunt, 220 West 57th Street, New York, N. Y.

Jan. 18-19.—AMERICAN FORESTRY ASSOCIATION. Annual convention, Washington, D. C. Executive Secretary, P. S. Ridsdale, 1410 H Street, N. W., Washington, D. C.

Jan. 19.—AMERICAN SOCIETY OF ENGINEERING CONTRACTORS. Annual meeting, New York, N. Y. Secretary, J. R. Wemlinger, South Ferry Building, New York, N. Y.

Jan. 20, 1917.—WESTERN PAVING BRICK MANUFACTURERS' ASSOCIATION, Kansas City, Mo. Secretary, G. W. Thurston, 416 Dwight Bldg., Kansas City, Mo.

Jan. 23-25, 1917.—AMERICAN WOOD PRESERVERS' ASSOCIATION. Annual meeting, New York City. Secretary, F. J. Angler, B. & O. Mt. Royal Sta., Baltimore, Md.

Feb. 5-12, 1917.—AMERICAN ROAD BUILDERS' ASSOCIATION. Seventh American Good Roads Congress and Eighth National Good Roads Show, Mechanics' Hall, Boston, Mass. Secretary, E. L. Powers, 150 Nassau street, New York City.

Feb. 7-15, 1917.—TENTH CHICAGO CEMENT SHOW, Coliseum, Chicago, Ill. Secretary, Blaine S. Smith, 210 South La Salle Street, Chicago.

Feb. 12-14, 1917.—AMERICAN CONCRETE PIPE ASSOCIATION. Annual convention, Chicago, Ill. Secretary, E. S. Hanson, 538 South Clark Street, Chicago, Ill.

Feb. 8-10, 1917.—AMERICAN CONCRETE INSTITUTE, Hotel La Salle, Chicago, Ill. Secretary, Harold D. Hynds, 1418 Walnut Street, Philadelphia, Pa.

Feb. 19-24, 1917.—SOUTHWESTERN CONCRETE ASSOCIATION. Annual meeting and concrete show, Convention Hall, Kansas City, Mo. Chairman, Show Committee, Chas. A. Stevenson, 1433 West 10th Street, Kansas City, Mo.

American Waterworks Association.

The thirty-seventh annual convention of this association will be held at the Jefferson Hotel, Richmond, Va., May 7-11, 1917.

Several important committees will report at this convention—Committee on Electrolysis and representatives to the National Electrolysis Committee; Committees on Water Consumption, Private Fire Protection Service,

and Revision of the Constitution. Some important changes in the constitution will be considered. Members are urged to assist the committees in their work, and to send to the chairman of each committee any suggestions or information that will assist them, that their work may be as effective as possible.

Members are urged to send at once, or as soon as possible, to the secretary suggestions for papers or topics for discussion on live subjects that would interest members.

"If you cannot prepare the paper or discussion yourself, suggest someone whom you know to be qualified to do so. The executive board needs your active personal interest and assistance to make the convention a thoroughly live, up-to-date and helpful one.

"The executive board is particularly anxious that the superintendents shall have the fullest opportunity to be heard through papers and particularly experience talks. At least three full sessions will be assigned to 'Superintendent's Day,' if the superintendents will only provide the material to properly fill the time. The active assistance of the superintendents, of small as well as large plants, is necessary to make the day the success that it should be.

"Prepare a short paper on some practical waterworks subject, giving some personal experience or describing some difficulty or unusual construction work which you have done.

"Send 'Questions' concerning some difficulty which you have had in your work, something in which you think your brother members can help you.

"Suggest topics for open discussion at the meetings."

American Society of Mechanical Engineers.

The annual meeting of the American Society of Mechanical Engineers was held Dec. 5 to 8 at the Engineering Societies' Building, 29 West 39th street, New York City. The retiring president, Dr. D. S. Jacobus, made an address on "The Relation of Education to Engineering." Dr. Jacobus laid emphasis on certain qualities of value in making for success in engineering which had been overlooked in some estimations of the requisites for such success, among them interest in the work, amenability to discipline, cheerfulness and perseverance. "The courses in engineering colleges," he said, "could profitably be broadened to include some cultural studies and some relating to the business side of the profession, together with training in composition at least sufficient to insure the writing of concise and logical reports in good English."

Dr. Ira N. Hollis, president of Worcester Polytechnic Institute, was elected president; Charles H. Benjamin, Arthur M. Greene, Jr., and Charles T. Plunkett, vice-president; Robert H.

Fernald, William B. Gregory and C. R. Weymouth, managers, and William H. Wiley, treasurer. President Hollis, in a brief inaugural address, spoke of the duty of engineers and the spirit of profession.

American Association for the Advancement of Science.

The sixty-ninth annual meeting of the American Association for the Advancement of Science, and the national scientific societies affiliated with it, will convene in New York city in the last week of December, with Columbia University, New York University, the City College, the American Museum of Natural History and other educational and scientific institutions having general charge of the convention. An attendance of more than 2,000 is expected.

Dr. Charles R. Van Hise, president of the University of Wisconsin, will preside. Among the national societies which will probably be represented are the American Mathematical Society, the Astronomical Society of America, the American Physical Society, the American Chemical Society, the Geological Society of America, the Association of American Geographers, the Paleontological Society of America, the Botanical Society of America, the American Phytopathological Society, the American Society of Naturalists, the American Society of Zoologists, the Entomological Society of America, the American Association of Economic Entomologists, the Association of American Anatomists, the American Physiological Society, the American Society of Biological Chemists, the American Society for Experimental Pathology, the Society of American Bacteriologists, the American Philosophical Association, the American Psychological Association and the American Anthropological Association.

The executive committee in charge consists of Henry F. Osborn, chairman; J. J. Stevenson, Professor M. I. Pupin, Professor Charles Baskerville, N. L. Britton, Dr. Simon Flexner, E. B. Nelson, and Professor J. McKeen Cattell, secretary.

American Concrete Pipe Association.

The annual convention of the American Concrete Pipe Association is to be held in Chicago, February 12, 13 and 14, 1917, during the second week of the Cement Show. The officers of the association are: President, G. F. Lillie, Tremont, Neb.; vice-president, F. W. Scanling, Chrisman, Ill.; secretary-treasurer, E. S. Hanson, Chicago, Ill.; directors, H. K. Cain, Mankato, Minn., and W. D. Middleton, Emmetsburg, Ia.

Oklahoma Municipal League.

The third annual session of this league was held at Oklahoma City, Okla., Nov. 27-28. The meeting was presided over by J. A. Weiselogel, of Pawhuska, in the absence of Val Mullen, of Ardmore, president of the association. Dr. Blachley, of the univer-

sity, acted as secretary, in the absence of Major John Alley with the Oklahoma troops in Texas.

The speaker of the first afternoon session was Mayor C. W. Green, of Kansas City, Kan. His subject was "State Against Municipal Regulation of Municipal Public Utilities." Other speakers were Frank P. Stearns, mayor of Shawnee; J. W. Duke, state health officer; F. F. Blachley, of the State University, and Mayor Radcliffe, of Ada.

"The Modern American City" was the topic of Mayor Lindsley at the evening session of the association, which was held in the city hall.

Mr. Lindsley told of the Dallas Society of Municipal Research and of the spirit of city employes and officials in behalf of the city. He related the experience of Dallas in electing as mayor a man whose business career had been

in finance and banking, and of expressed doubts prior to election of the ability of such a man to win. He said the demonstrated fact seems to be that in the modern city the cause will be successful if it is right. He told of the municipal exhibit of Dallas at the recent state fair and invited the Oklahoma City officials to come next year and see a greater city exhibit in better environment.

"A distinctly forward movement in the government of our American cities commenced as a result of the destructive storm in Galveston, Tex., on Sept. 8, 1900, leaving that city prostrate and almost bankrupt. A brave and intelligent citizenship met a problem demanding the very best solution, and there was born the commission form of government as we know it at the present time in the United States.

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PROBLEMS CITIES ARE STUDYING WITH EXPERTS

A SEWER SYSTEM and DISPOSAL PLANT are to be constructed by Hinckley, Minn. Plans for the work have been completed by Fred Bass, 244 Plymouth Building, Minneapolis, Minn.

In constructing a sanitary SEWER SYSTEM and DISPOSAL PLANT, the village of Northville, Mich., had plans and specification prepared by Clarence W. Hubbell, 2338 Penobscot Building, Detroit, Mich.

El Dorado Springs, Mo., is to improve its WATERWORKS SYSTEM following the preparation of plans by C. H. Curry, Kansas City, Mo.

Gibson City, Ill., is to construct a LIGHT and WATER plant from plans prepared by Melliush and Broyhill, Unity Building, Bloomington, Ill.

A \$65,000 REINFORCED CONCRETE BRIDGE is to be constructed by the commissioners of Allen County, Fort Wayne, Ind. The plans for the structure were prepared by A. W. Grosvenor, 408 Bass Block, Fort Wayne, Ind.

Berwyn, Ill., is receiving bids on its proposed GARBAGE INCINERATOR. Construction follows the preparation of designs and specification by Lewis-Capron Company, 900 South Michigan avenue, Chicago, Ill.

Fremont, O., is fighting the local light company for lower RATES and the case is before the public utilities commission. The city has retained as its expert G. Herman Gamper, of the Power Engineering Company, 421 New First National Bank Building, Columbus, O.

Norfolk, Va., is to appeal to the State Corporation Commission for a lower GAS RATE. The city has retained Milo R. Maltbie, city chamberlain of New York, N. Y., and W. F. Hine, of the New York State Public Service Commission, as its experts to investigate, report and conduct its case.

A SEWER SYSTEM is to be constructed by Protection, Kans. Plans are being prepared by Black & Veatch, 507 Interstate Building, Kansas City, Mo.

Buchanan, Mich., is to construct a sanitary SEWER SYSTEM and DISPOSAL PLANT, following an election next March. The village has retained John W. Toyne, South Bend, Ind., as consulting engineer on the project.

The village of West Minneapolis, Minn., is to construct a complete municipal GAS PLANT. The plans and specifications for the installation are being furnished by F. C. Shepard, 16-18 South 7th street, Minneapolis, Minn.

Sedalia, Mo., is to improve its SEWERAGE SYSTEM by building a sewer disposal plant and extending its sewer service. The consulting engineers for this work are Burns & McDonnell, Interstate Building, Kansas City, Mo.

New Brighton, Pa., before entering into a new STREET LIGHTING contract with the Beaver County Light Company, had an investigation of the conditions by H. O. Swoboda, consulting engineer, Empire Building, Pittsburgh, Pa., who has just made a report.

A WATER and LIGHT PLANT is to be constructed by the city of Moran, Kans., at a cost of \$42,000. The plans and specifications for the work have been completed by W. B. Rollins & Co., 209 Railway Exchange Building, Kansas City, Mo.

Syracuse, N. Y., is planning comprehensive improvements which include GRADE CROSSING ELIMINATION, utilization of the Erie Canal bed, retracking of railroads and the construction of a union interurban terminal and the development of a public plaza. Bion J. Arnold, 105 South LaSalle Street, Chicago, Ill., has completed preliminary plans for the Grade Crossing Commission.

PERSONALS

Craighill, Colonel William E., corps of engineers, U. S. A., who has had supervision over the engineering district of Rhode Island since the departure of Colonel John Millis a few months ago, until the past two weeks, when he was relieved on account of illness, died Nov. 26, at the army hospital, Washington.

Beardsley, Egbert, superintendent of the Catskill, N. Y., waterworks, died Nov. 27, after a short illness.

Jesse Taylor, prominent good roads advocate, publisher and banker, president of the Ohio Good Roads Federation, died at his home in Jamestown, O., Dec. 7. Mr. Taylor has galvanized "Get Out of the Mud" into life by his many "good roads" speeches and through the magazine Better Roads, of which he was the editor. He urged the people everywhere to "get on the good roads wagon," and to join and support some good roads organization. He was president of the Ohio Good Roads Federation when death overcame him. He was secretary of the Interstate Stone Manufacturers' Association of Ohio and director general of the National Highway Association, Washington. Mr. Taylor was born in Green County fifty-three years ago, and attended college at Yellow Springs and was admitted to the practice of law both in Ohio and Kansas. He was elected and filled the offices of probate judge and prosecuting attorney at Garden City, Kan.

Parlin, Raymond W., has been appointed deputy commissioner of street cleaning by Commissioner J. T. Fetherston, to succeed A. B. Clark, resigned. The deputy-commissioner receives a salary of \$5,000 a year.

Nolan, Joseph E., manager of the retail department of a store, has been appointed street supervisor of the Sixth Ward of Albany, N. Y.

Durham, Henry Welles, county engineer of Bergen County, Hackensack, N. J., who has been absent on leave with his regiment, the 7th New York Infantry at McAllen, Texas, has returned to his office, having come back to New York with his command, which has been mustered out of active duty with the United States Government.

Schreiber, Curt, chief of the E. Rutherford, N. J., fire department, has resigned.

Moorhouse, William R., commissioner of public works of Chicago, Ill., has resigned.

Bassett, Frank, seventeen years a member of the fire department of Sault Ste. Marie, Mich., has been elected chief.

Fisher, N. I., has been appointed assistant superintendent of the Woodland City, Cal., waterworks.

Shafer, W. L., secretary of the Chamber of Commerce of Bluefield, W. Va., has been elected manager of the new Chamber of Commerce of Lebanon, Pa.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago—An awakening of interest on the part of many municipal buyers is found in numerous inquiries which include 1,250 tons for Eveleth, Minn., 1,150 tons for Ann Arbor, Mich., 600 tons for Erie, Pa., and 1,500 tons for Toledo, Ohio. At St. Paul the expected award of 1,250 tons was cut to 450 tons, and at Bay City, Mich., the Glamorgan Pipe & Foundry Company was the successful bidder for 500 tons. Quotations: 4-inch, \$42.50; 6-inch and larger, \$39.50; class A, \$1 extra. Birmingham—The makers have received some orders on specifications submitted some time ago, but new business shows a disposition to halt. The pipe market is really in an unsettled condition owing to price advances. The United States Cast Iron Pipe & Foundry Company has started work at Bessemer, Ala., on 35,000 tons of the 65,000-ton Argentine order. Quotations: 4-inch, \$37; 6-inch and upward, \$34; 16-foot lengths, \$1 extra. San Francisco—The freight rate advance Jan. 1 will be \$2 per ton. There is no very large corporation buying at present, as most early requirements have been covered. The city of Los Angeles recently placed an order for 1,714 tons, and small orders have been placed by Porterville, Cal., and Douglas, Ariz.

Whittier, Cal., was in the market for 260 tons, and Calexico took bids on a small lot Dec. 5. Quotations: \$45 per net ton for 6-inch and over, \$48 for 4-inch, \$1 extra for class A. New York—Quite a number of small municipalities are purchasing pipe without the formality of public letting. Private gas and water companies are freely buying for spring delivery. The bulk of business thus transacted privately is much greater than usual at this season. It not only consists of many small purchases, but a good number of sizable contracts. The advance of \$2 per ton is in effect. Quotations: 6-inch, class B and heavier, \$39.50; class A, \$40.50.

Lead.—Lead has steadied at higher prices, the leading interest having finally advanced to 7.50 cents, New York. Quotations: New York, 7.50 cents; St. Louis, 7.40 cents.

The Ransome Concrete Machinery Company, Dunellen, N. J., on account of rapidly increasing business, has just opened another factory at Reading, Pa. This will double the output of the company in the line of small mixers and road paving machinery.

The Baker Manufacturing Company, Springfield, Ill., has issued a very seasonable folder describing and illustrating the horse-drawn snow plows, auto-truck snow plows, and snow scraper and loader that it manufactures.

It is of interest to note that Sir Albert Stanley, a member of the newly appointed English Cabinet, is a brother of vice-president Stanley, of The **Game-well Fire Alarm Telegraph Company,** New York, N. Y., and Newton Upper Falls, Mass.

The Terry Steam Turbine Company, Hartford, Conn., has appointed Stephenson & Nichols, Monadnock Building, San Francisco, Cal., as representatives in northern and central California and northern Nevada.

The Asbestos Protected Metal Company, Pittsburgh, Pa., announces the appointment of Mr. Meyer Davis, formerly chief engineer, as manager of its San Francisco branch, located in the Hobart Building. One of the company's products is the Pittsburgh paving joint used in road work.

The Goodyear Tire and Rubber Company, Akron, O., announced the best year in its history at the recent annual meeting held at the general offices. Gross business jumped from \$36,000,000 to \$63,000,000, an increase of 80 per cent over 1915. The growth has been in domestic and peaceful foreign business. Net earnings of the company increased from \$5,000,000 to \$7,000,000. The company has actually had to turn down some orders this year, on account of factory capacity. Buildings now under way will practically double its

MUNICIPAL INDEX

(Continued on page 753.)

quirements, 800 words. Engineering and Contracting, Nov. 1. 10 cts.
Street Traffic Problems. Make the side streets more attractive and traffic congestion problems will tend to disappear. By Nelson P. Lewis, 1,000 words. Canadian Engineer, Nov. 23. 15 cts.

BRIDGES AND DAMS.

Bascule Bridge for Highway Service in California. All stress is carried by cantilever action. 1 ill., 1,200 words. Engineering Record, Nov. 25. 15 cts.

New Method of Erection Adopted in Raising Longest Highway Arch Span. Bridge was assembled in horizontal position and each arch raised by tackle from central span. 7 ill., 1,250 words. Engineering Record, Nov. 11. 15 cts.

Building a Concrete Girder Bridge. Wrecking the old structure; excavation; methods of handling concrete. By Daniel J. Hauer. 4 ill., 1,750 words. The Contractor, Nov. 1. 20 cts.

I-Beam and Concrete Highway Bridges in Adams County, Indiana. 3 ill., 600 words. Engineering and Contracting, Nov. 22. 10 cts.

A New Formula for the Crown Thickness of Arches. Diagram for various kinds of bridges under different conditions of design. By J. P. Schwada. 6 ill., 1,900 words. Engineering News, Nov. 9. 15 cts.

Ferro-Concrete Bridges in England and Wales. 4 ill., 1,200 words. The Surveyor, Oct. 27. 40 cts.

Standard Pony-Truss Bridges for Michigan Highways. By C. D. Dewart. 3 ill., 600 words. Engineering News, Nov. 23. 15 cts.

Complex Grade Changes in a Highway Bridge. Span is skewed at both ends and grade changes and crown transition do not coincide. 2 ill., 700 words. Engineering News, Nov. 30. 15 cts.

Raise Settled Columns of Big New York Viaduct. Riverside Drive structure across Manhattan valley warped by settlement of columns and restored to level by jacking up one column at a time. 2 ill., 1,200 words. Engineering Record, Nov. 4. 15 cts.

Jacking Up a Viaduct; Buckling Columns Give Trouble. Viaduct on Riverside Drive, New York, settled and had to be jacked into place. 6 ill., 2,800 words. Engineering News, Nov. 9. 15 cts.

Erection Methods, Bloor Street Viaduct. Brief review of methods adopted in erecting superstructure. By J. G. Jack. 4 ill., 1,000 words. Canadian Engineer, Nov. 16. 15 cts.

Repair of the Tres Cruces Dam, Cavite Province, P. I. Strengthening of thin masonry dam by adding buttresses. By C. R. Bennett. 3 ill., 1,500 words. Engineering News, Nov. 30. 15 cts.

Formulas for Width of Base of Gravity Retaining Walls. Dimensions and width of footings determined for various cases based upon middle third and overturning limits. By T. A. Smith. 3 ill., 1,250 words. Engineering Record, Nov. 4. 15 cts.

Paints for Steel and Iron Structures. Kinds of paint suitable; selection of pigments and vehicles. Cleaning surfaces and applying paints. The use of driers. 1,400 words. Municipal Journal, Nov. 16. 10 cts.

A Flooring for Bridges and Viaducts. Objectionable features of planked flooring. Asphalt concrete is used in Pueblo and costs less, while lasting longer. By A. W. Olson, 1,500 words. Municipal Journal, Nov. 16. 10 cts.

Proposed Motor Truck Loads for Highway Bridges. By O. W. Childs. 1 ill., 800 words. Engineering News, Nov. 9. 15 cts.

STRUCTURAL MATERIALS.

Theory of Corrosion of Metals by Water. Abstract of report of committee of New England Water Works Association. 1,100 words. Fire and Water Engineering, Nov. 8. 10 cts.

Engineering Contractor Talks on Earth Shrinkage. By S. P. Baird. 1,500 words. Engineering News, Nov. 2. 15 cts.

Experience of 41 Railways in Small Concrete Jobs. Methods of economical handling of concrete. Make-up of gangs and tools required. 1,000 words. Engineering News, Nov. 2. 15 cts.

MISCELLANEOUS.

The Lake City Ice Plant. Municipal ice and cold storage plants combined with water and light plant in city of

6,000 population. 1 ill., 1,000 words. Municipal Journal, Nov. 16. 10 cts.

Ottawa Public Comfort Station. Some observations concerning the desirable features to be observed in the design and construction. By H. L. Seymour. 3 ill., 2,000 words. Canadian Engineer, Nov. 2. 15 cts.

Machinery as Substitute for Laborers in Trench Digging. 2 ill., 800 words. Fire and Water Engineering, Nov. 22. 10 cts.

Contract Work and Day Work. Relative Advantages. By H. C. H. Shenton. 1,800 words. The Surveyor, Nov. 10. 40 cts.

Scientific Selection of Shovels for Contract Work. By G. W. Benton. 1,000 words. Concrete, Nov. 20 cts.

Effect of Channel on Stream Flow. Paper before the Boston Society of Civil Engineers, by N. C. Grover. 6 ill., 7,000 words. Journal of Boston Society of Civil Engineers, Nov. 50 cts.

Velocity Coefficients for a Dredged Drainage Canal. 6 ill., 1,200 words. Engineering News, Nov. 30. 15 cts.

Photogrammetry for Taking Topography of Watershed. Describes a simple device for plotting topography from photographs. By D. H. Nelles. 1 ill., 1,800 words. Engineering News, Nov. 9. 15 cts.

Aerial Tramway at Niagara Falls. During 3 months of operation this novel cableway has been a valuable feature from the viewpoint of tourists. 2 ill., 1,250 words. Electric Railway Journal, Nov. 11. 10 cts.

Cable Inclines on the Sao Paulo Railway in Brazil. Passenger and freight traffic carried up steep grades on cable incline. By F. A. Molitor. 3 ill., 1,300 words. Engineering News, Nov. 23. 15 cts.

Unusual Slide of Canal Lining and Its Repair. 7 ill., 2,400 words. Engineering News, Nov. 30. 15 cts.

An Office Record System for Civil Engineers. By J. L. Parsons. 10 ill., 5,500 words. Engineering and Contracting, Nov. 29. 10 cts.

Pneumatic Mixer Lines Railway Tunnel Under Traffic. 5 ill., 1,500 words. Engineering News, Nov. 16. 15 cts.

Effects of Exposure on Tar Products. By C. S. Reeve and B. A. Anderton. Office of Public Roads, Washington. 1,500 words. Canadian Engineer, Nov. 9. 15 cts.

factory, and to house workmen this company is back of a plan to build 1,000 houses in its part of the city in the immediate future. All of the directors were reelected, as follows: F. A. Seiberling, C. W. Seiberling, G. M. Stadelman, F. H. Adams, P. W. Litchfield, H. B. Manton and J. P. Loomis. The directors in turn reelected the officers, as follows: F. A. Seiberling, president; C. W. Seiberling, vice-president; G. M. Stadelman, vice-president and sales manager; P. W. Litchfield, vice-president and factory manager; A. F. Osterloh, secretary, and F. H. Adams, treasurer.

Tests Conducted by Bureau of Standards.

Tests of materials and products representing a wide range of industrial processes have been made in the course of recent activities of the United States Bureau of Standards. Engineering instruments, iron pipe and railroad track scales were among the subjects of such tests.

The bureau has received many requests for the testing of iron pipe. There are no machines in this locality for the complete testing of pipe except those owned by the United States Steel Corporation. There are, however, in this vicinity and through the country many smaller independent pipe-manufacturing corporations. It is from these that requests have been received from time to time for both hydraulic and either tension or compression tests. Owing to lack of facilities the bureau at first referred corporations which desired to have certain tests made to a commercial testing laboratory. The latter, however, found on attempting the work that its machine was not of sufficient capacity, and as a consequence the bureau did the work. An important test was that of two pieces of 6-inch flanged iron pipe in tension. Twelve relief valves for testing fire hose were tested for use by steamboat inspectors.

NEWS OF THE SOCIETIES

(Continued from page 755.)

"In 1915 there were eighty-one cities of over 30,000 inhabitants each operating under commission government. Two of these were in Oklahoma—Muskogee and Oklahoma City—and seven were in Texas.

"Throughout the United States cities have continually come within the last few years under commission government management; and I believe there is no instance where a city has adopted a commission form of government and has returned to the old Federal plan or aldermanic form.

"It has been said that commission government has largely resulted in these reforms:

"The elimination of party politics, dethronement of the city boss, prevention of subordination of city administration to the purposes of political organization, establishment of the short ballot and simplification of elections."

"And these have brought about greater efficiency in government:

"Providing a government at work every day in the year, substituting efficiency for red tape, rendering prompt attention to affairs, providing publicity of proceedings, bringing about either a reduction of taxation or greater value for taxes paid, reducing water rates, increasing wages and providing intelligent and efficient municipal accounting.

"Those cities which have inaugurated commission-manager government have taken a distinctively forward step in recognition of the principle that a city owes no man in it a job; that the sole requisite of a city employee should be, not whether he lives in the city or out of it, not whether he needs a job or does not need a job, not whether he is popular or is not popular, but whether he will render more efficient service to the community than any other man who may be available at the compensation which the city can pay.

"The term 'commission-manager government' is ordinarily used as synonymous with 'city-manager government.'

"There are today in the United States ninety-two cities, having a combined population of 1,408,069, under city-manager government. This includes, as the largest city under this form of government, Grand Rapids, Mich., with 141,856 people, and as the smallest city, Holtville, Cal., with 1,000 people. The salaries of city managers range from \$12,500, which is paid to H. M. Waite, city manager of Dayton, down to \$125 per annum, which is paid to C. A. Brown, city manager of Sherrill, N. Y., having a population of 1,500 people.

"Within the last year eleven cities in the United States have come under city-manager form of government, and cities in twenty-eight different states in the Union have adopted this form of government. Particularly is this true in the quite progressive states of Ohio and California."

League of Texas Municipalities.

Health measures in Texas with especial reference to the work of the sanitary engineering department of the state board of health was the chief subject discussed at the meeting of the League of Texas Municipalities, held Oct. 26 and 28 at Hillsboro, the fourth annual convention of the organization. Such emphasis was given to the work of State Sanitary Engineer V. M. Ehlers during the last two years that a resolution was adopted unanimously urging the legislature to provide more adequately for his department, giving it an appropriation sufficient to enlarge its scope and provide laboratories and equipment so that it might be made of greater value to municipalities and communities throughout the state.

The league adopted also a resolution to require more rigid enforcement of sanitary and plumbing ordinances and to require connections to be made with sewers within a distance of 300 feet, and urging that cities and towns having less than 5,000 population and now permitted assessments up to 65 cents

on the \$100 valuation for municipal purposes be permitted to vote an additional 25 cents on the \$100 for sanitary improvements. It is claimed that typhoid fever and deaths from typhoid in Texas would be greatly reduced by proper sanitation.

Stricter enforcement of the anti-stream-pollution law also was urged, for one reason that the extensive oyster fields in the Gulf would not be subject as now to pollution, which already, it was claimed, has occasioned millions of dollars' loss. At the present rate of population increase with an equal enlargement of the sewer systems it is estimated that one-half the flow of Texas rivers in 1927 at low stages will be sewage emptied into those rivers. The present discharge of 400,000,000 gallons of sewage daily into Texas streams is greater than the flow of the Brazos river at low stage.

The New Jersey Sewage Works Association.

A meeting of The New Jersey Sewage Works Association was held at Collingswood on November 25, at which meeting the following cities were represented: Burlington, Plainfield, Atlantic City, Beach Haven, Haddon Heights, Collingswood, Newton, Hightstown, Riverside, Chatham, Audubon, Trenton, New York City, Bridgeport, Stone Harbor, Magnolia and Merchantville.

Chester G. Wigley, chief of the Bureau of Engineering, State Department of Health, addressed the meeting on "The Keeping of Sewage Disposal Plant Records." There was also a talk on flush tank matters by S. Fischer Miller, president of the Pacific Flush Tank Company.

After the luncheon, which was served at the High School, inspections were made of the Collingswood, Haddon Heights, Audubon and Oaklyn sewage disposal plants; the trip being made by automobiles.

Montana Municipal League.

The sixth annual convention of this league was held at Lewistown, November 20-22. Great Falls was chosen as the place for the next meeting and the following officers elected: A. L. Mitchell, of Harding, president; W. L. Harrison, of Great Falls, first vice-president; C. H. Lane, of Butte, second vice-president; Mr. Truitt, of Bozeman, third vice-president; H. L. Fitton, of Lewistown, secretary and treasurer.

The most important action taken at the opening session was the adoption of a resolution urging Governor Stewart to impress upon the legislature in his annual message the necessity for a redraft of the laws relating to improvement districts and to licenses for revenue in cities.

In the afternoon Mayor Mitchell, of Hardin, the president, took the chair. The feature of the session was an able address by H. L. DeKalk, of Lewistown, on "Judicial Decisions as Related to Municipalities."

In the evening there was a general

discussion on playgrounds, led by O. B. Whipple, of the horticultural department of the Bozeman College. A discussion of sewage disposal was led by William Cobleigh, chemist at the Bozeman college.

The discussion at the Wednesday morning's session related to street paving and lighting, excellent addresses being made by City Engineers Birkland, of Lewistown, and Schenkenberger, of Billings.

In the report of the legislative committee, the Butte and Walkerville delegates strongly opposed the recommendation that police judge be appointed instead of elected, and this was stricken out.

North Carolina Drainage Association.

Lumberton was chosen as the next place of meeting by the North Carolina Drainage Association at the ninth annual conference held at Greensboro, Nov. 22 and 23. A mid-winter meeting will be held in Raleigh.

Officers were elected as follows: M. E. Sherwyn, Raleigh, president; Joseph Hyde Pratt, Chapel Hill, secretary-treasurer. Several vice-presidents were elected, among them being D. B. McNeill, Lumberton; H. M. Lynde, Raleigh; Benahan Cameron, Durham; F. R. Baker, Raleigh, and J. L. Becton, Wilmington.

Thursday morning's session convened at 9.30 o'clock, with Professor M. E. Sherwyn presiding. Harry Cowley, of Edgecombe County, spoke on the "History of Tile Drainage," and was followed by H. M. Lynde, drainage engineer of the U. S. Office of Public Roads and Rural Engineering, whose subject was "Special Problems in Drainage." F. R. Baker, drainage engineer of the North Carolina Department of Agriculture, made an interesting talk on "Terracing." There were interesting reports on results of use of tile drainage by different members, and the report of committees on tile drainage contests. The final business of the session was the transaction of routine business; report of nominating committee, and selection of next place of meeting.

Alabama Good Roads Association.

The annual convention of this association was held at Birmingham, Ala., Nov. 15 and 16. John Craft, of Mobile, was again elected president of the Alabama Good Roads Association, and vice presidents were selected as follows: John W. O'Neill, Birmingham, first; J. E. Pierce, Huntsville, second; Frank S. White, Birmingham, third; B. W. Duke, Gadsden, fourth; J. A. Rountree, secretary.

The association went on record as being opposed to the present convict lease system of the state. This action was taken through a resolution which further declared in favor of abolishing the state convict lease system, putting the state convicts on the public roads, and pledging the association to do all possible to bring this about.

What can be accomplished through the use of convicts on the roads was

demonstrated in a stereopticon lecture by Jefferson County Engineer, George H. Clark. More than 50 slides were shown, demonstrating how the Jefferson county convicts were worked on the roads to the advantage of both men and the county, and at an economy of cost.

Mr. Clark told the good roads men that Jefferson county was working on its roads more than 350 convicts, was making all the clothing and running a steam laundry and a county farm by the female labor of convicts and that it was all economical for the county. He said that it had been thoroughly demonstrated and found to be one of the best things that could have happened to Jefferson county. During the four years that convicts have been worked on the roads approximately 200 miles of chert road has been built, 400 miles of chert macadam road and 800 miles of first-class clay, the remaining roads being classed as second class.

A practical demonstration of cement roads and road building was given through stereopticon views by Mr. Burks of the Portland Cement company and proved very interesting.

Virginia Road Builders' Association.

To arrange for the annual meeting of the Virginia Road Builders' Association at Norfolk, Va., January 16, 17 and 18, the following committee has been appointed by the Tidewater Automobile Association, which secured the convention for Norfolk: C. W. Bender, chairman; Alan G. Burrow, H. O. Nichols, A. Crittenden Wood, E. E. Palen, G. Tayloe Gwathmey, J. Edward Cole, Jacob Leicht, T. A. Brittingham and Max Pincus.

The Virginia Road Builders' Association will bring about 200 delegates from all parts of the state, many of them authorities on improvement and maintenance of roads to Norfolk. The sessions will be held at the Monticello Hotel and the Tidewater Automobile Association committee will plan several entertainments for the visitors.

Fire Underwriters' Association of Kentucky.

The twenty-third annual meeting of this society was held at Louisville, Nov. 23. A. L. Macpherson, president, delivered his annual address, in which he emphasized the improvement in fire fighting facilities made by Kentucky cities during the year.

"During the year Taylorsville, Campbellsville and Providence have installed water works and equipment for fighting fires," he said. "They have been raised from six to four and one-half class. The following cities have purchased and installed motor fire fighting equipment: Ashland, Henderson, Hickman, Paris, Carlisle and Mayfield. Louisville has purchased one motor-driven truck and two combination machines. Paducah's equipment is entirely motorized, with the exception of one ladder truck. In addition a number of towns have improved their miscellaneous equipment. These equip-

ments are in a large measure due to the combined efforts of the Fire Prevention Association, the Kentucky Actuarial Bureau and the Fire Marshal's office. Too much stress cannot be laid upon efforts in this direction."

Mr. Macpherson said the conflagration during the year in Nashville, Tenn., should induce all property holders to give serious consideration to the abandonment of the shingle roof.

David Caldwell, State agent for the National Fire Insurance Company, was elected president. E. F. Scott, of Nashville, Tenn., special agent of the German Alliance, whose territory includes Kentucky, was elected vice-president, and Milton C. Miller was re-elected secretary. The following were elected members of the executive committee: L. C. Riker and M. J. Lafon, of Harrodsburg, and E. P. Rogers, of Louisville. They will serve with the following hold-overs: Ralph Hartsorn and S. P. Kennedy, of Louisville, and W. J. Gilsdorf, of Lexington.

Oklahoma Good Roads Week.

Road experts from all parts of the country, county highway engineers, county commissioners and good roads enthusiasts from Oklahoma will gather at Norman from Jan. 1-6 for the first annual good roads week held in the state.

The meeting will be held under the auspices of the college of engineering, at the University of Oklahoma, with the co-operation of Oklahoma state highway officials and county men. The announcement is the culmination of plans begun several months ago, when Professor J. I. Tucker of the school of civil engineering was made state consulting engineer. Aiding him in the work is Professor R. C. Terral, a new member of the Oklahoma faculty, formerly state highway commissioner for Kentucky.

The program for good roads week will be made especially to meet the needs of county commissioners, who will be just beginning their terms of office, most of them without experience, and for county engineers, local good roads clubs and legislators who are seeking the laws that will best aid in transforming Oklahoma roads from gully-washed paths to graded and graveled highways.

Among the men who will appear on the program will be L. L. Wymans, United States highway engineer; A. B. Gearhart of Kansas, who had seen roads in the Sunflower state transformed from the present condition of Oklahoma's roads into models; M. L. Cunningham, state engineer; George B. Noble, state highway commissioner; experts on road building materials from the Oklahoma geological survey; James I. Tucker of the college of engineering; R. C. Terral, formerly state highway commissioner for Kentucky, and many Oklahoma road engineers.

One feature is to be a moving picture show each night, the films for which will be taken of actual work in improving highways in other states.

ADVANCE CONTRACT NEWS

ADVANCE INFORMATION BIDS ASKED FOR

CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Ala.	Grove Hill	Dec. 15	Improving roads; \$30,000 available	A. L. Smith, Co. Engineer.
S. C.	Greenville	Dec. 15	Street paving and sidewalks; \$130,000 available	W. F. B. Haynsworth, City Engineer.
W. Va.	Bluefield	10 a.m., Dec. 15	Draining, grading, surfacing and bridging 36 miles of rd.	W. J. McClaren, Co. Rd. Engr., Welch, W. Va.
Pa.	Philadelphia	Dec. 15	Grading several streets, repairing and patching and laying asphalt pavements	Bureau of Highways, Dept. Public Works.
Cal.	Ventura	11:30 a.m., Dec. 15	7.42 miles 16-ft. concrete highway	Board of Supervisors.
Ill.	East St. Louis	Dec. 15	Improving Missouri Ave.; cost, \$60,000	Bd. of Local Improvement.
Tex.	Houston	noon, Dec. 15	Paving two streets	E. E. Sands, City Engr.
Ill.	Berwyn	Dec. 16	Asphaltic concr. and mac. pav. and concrete curbing	Bd. of Local Improvements.
Ala.	Luverne	Dec. 16	Improving 5 miles of road	J. M. Garrett, Co. Engr.
La.	Monroe	Dec. 18	Grading, draining and graveling several roads	J. W. Billingsley, Engr.
O.	Cleveland Heights (Warrensville P. O.)	Dec. 18	Grading, draining curbing and paving with brick, asphalt or macadam, several roads	F. A. Pease, Engineering Co., Marshall Bldg., Cleveland, O.
Tex.	Galveston	11 a.m., Dec. 18	46,000 sq. yds. brick pavement or 43,700 sq. yds. asphalt pavement, concrete base, 13,250 ft. of curb, and 18,500 sq. yds. concrete sidewalk	J. M. Murch, Co. Aud.
Kans.	Ft. Scott	Dec. 18	Constructing 19 miles macadam road	E. E. Toles, Co. Engr.
Ill.	Amboy	Dec. 19	Paving with brick and constructing combined curb and gutter, cost \$25,000	F. W. Leake, City Engr.
Ill.	Berwyn	8 p.m., Dec. 19	Asphaltic concrete pavements, two jobs	O. N. Lindahl, Sec. Board of Local Improvements.
Mich.	Sault Ste. Marie	2 p.m., Dec. 20	0.83 mile macadam road construction	County Road Commissioners.
O.	Ravenna	Dec. 20	1,700 sq. yds. brick pavement, slag base and stone or concrete curb	S. E. Horsfall, Dir. of Public Service.
Mont.	Butte	Dec. 20	26,850 sq. yds. pavement, 7,000 ft. of gutter and sewers	J. J. Armstrong, City Engr.
Ia.	Storm Lake	Dec. 20	Grading 72 miles of county highway	G. K. McCullough, Co. Engr.
O.	Columbus	2 p.m., Dec. 21	Constructing state highways	Clinton Cowen, State Highway Comr.
Ohio	Cincinnati	Noon, Dec. 22	Repairing and reconstructing roads	A. E. Reinhardt, Clk. County Comrs.
O.	Matamoras	Dec. 23	Paving several streets with brick	D. R. Bradfield, Clerk.
W. Va.	Pineville	1 p.m., Dec. 23	Constructing 76 miles of earth road	Co. Engr., Mullens, W. Va.
Minn.	St. Paul	10:30 a.m., Dec. 26	Grading and improving several streets	H. W. Austin, Pur. Agt.
Ind.	Portland	10 a.m., Dec. 27	Constructing stone roads	John Bonifas, Co. Aud.
Cal.	Los Angeles	10 a.m., Dec. 27	Grad., oiling and curb. and constr. brick and concr. walks	Board of Public Works.
N. J.	Riverside	8:30 p.m., Dec. 28	3,300 cubic yards street grading	Lozier, Zabriskie & Van Keuren, Engrs., Bank Bldg., Hackensack, N. J.
Ind.	Anderson	10 a.m., Dec. 28	Seven stone or gravel roads	E. T. Flahavin, Co. Aud.
Va.	Roanoke	Noon, Dec. 28	Five-foot granolithic sidewalks	F. L. Gibboney, City Engr.
Ohio	New Concord	Dec. 30	1.5 miles brick or concrete pavement	W. C. Trace, Village Clk.
Ind.	Spencer	2 p.m., Dec. 30	Constructing macadam road	S. M. Royer, Co. Aud.
Ind.	Brownstown	1:30 p.m., Jan. 1	Constructing tarvia-macadam road	Albert Leudtke, Co. Aud.
Ind.	Greensburg	1 p.m., Jan. 1	Concrete and other roads	J. C. Barbe, Co. Aud.
Ind.	Greencastle	2 p.m., Jan. 1	Constructing five township roads	J. M. Allen, Co. Aud.
Wis.	Fond du Lac	Jan. 1	Concrete pavements; cost, \$20,000	J. S. McCullough, City Engr.
Ind.	Rockport	2 p.m., Jan. 1	Constructing county road	J. Frank Stocking, Co. Aud.
O.	Sidney	Jan. 1	Paving 6 miles of streets	T. Blake, Engineer.
Miss.	Lexington	11 a.m., Jan. 1	19.5 miles highway construction	M. L. Cully, Engr., Jackson.
Ind.	Bloomfield	2 p.m., Jan. 1	3 macadam roads	G. E. Kidd, Co. Aud.
Cal.	Los Angeles	Jan. 1	Grading and constructing oil macadam on 2.76 miles; cost, \$11,000	A. M. McPherrin, Clk. County Supv.
Ind.	Monticello	10 a.m., Jan. 2	Gravel and macadam roads	A. G. Fisher, Co. Aud.
Ind.	Corydon	2 p.m., Jan. 2	Constructing gravel and macadam roads	J. L. O'Bannon, Co. Aud.
Ind.	Logansport	10 a.m., Jan. 2	Township road construction	A. F. Flynn, Co. Aud.
Ind.	Jeffersonville	10 a.m., Jan. 2	Constructing macadam roads	G. W. Stoner, Co. Aud.
Ind.	Vevay	1 p.m., Jan. 2	Constructing township roads	J. W. Smith, Co. Aud.
N. J.	Keyport	Jan. 2	Warrenite paving on concrete base, cost \$65,000	G. D. Cooper, Co. Engr., Red Bank
Ind.	Corydon	2 p.m., Jan. 4	Gravel or macadam road	J. L. O'Bannon, Co. Aud.
Ala.	Moulton	Jan. 8	Five miles macadam road	J. C. Kumpke, Probate Judge.
Ia.	Independence	Jan. 10	Paving 31 blocks, cost \$100,000	City Clerk.
Ia.	Algona	8 p.m., Jan. 11	40,000 sq. yds. first-class pavement, and 40,000 ft. combined curb and gutter	T. S. De Lay, Engr., Creston, La.
Ia.	Cedar Rapids	Feb. 1	Paving thirteen blocks; cost, \$90,000	T. F. McCauley, Engr.
SEWERAGE.				
Ind.	Indianapolis	10 a.m., Dec. 15	Furnishing sewer pipe	L. K. Fesler, Co. Aud.
O.	Zanesville	Dec. 15	400 ft. 8 and 10-in. sewer	Carl Spencer, City Engr.
Cal.	Berkeley	10 a.m., Dec. 15	Constructing combined sewer	A. G. Briggs, City Clerk.
O.	Cuyahoga Falls	Dec. 18	13,200 ft. 8-in. and 12-in. sewers	E. D. Barstow, Engr.
Mo.	Sedalia	5 p.m., Dec. 18	Extending sewer and constructing septic tank and filter beds	Burns & McDonnell, Engrs., Kansas City, Mo.
Minn.	Benson	2 p.m., Dec. 18	Tile drainage ditches; cost, \$19,550	A. W. Van Slyke, Engr.
Minn.	Moorhead	2 p.m., Dec. 19	Constructing drainage ditches; cost, \$24,000	A. O. Houghlum, Co. Aud.
Ind.	Fort Wayne	1 p.m., Dec. 19	Constructing tile drainage ditch; cost, \$2,600	Will Johnson, Co. Aud.
O.	Cleveland	noon, Dec. 19	Constr. storm and san. sewer in Shaker Heights	D. W. Willard, Village Engr., Marshall Bldg., Cleveland, O.

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Pa.	Erie	Dec. 19	Constructing Mill Creek improvements; estimated cost, \$850,600	F. G. Lynch, City Engr.
Cal.	Waterford	Dec. 19	55,000 cu. yds. irrigation ditch excavation	C. C. Horsley, Sec. Irrigation District
Ill.	Berwyn	8 p.m., Dec. 19	Tile sewers and drains, two jobs	O. N. Lindahl, Sec. Board of Local Improvements
Ill.	Marengo	2 p.m., Dec. 20	Tile and open drains, cost \$73,127	A. L. Webster, Drainage Engr. Wheaton, Ill.
Mont.	Butte	Dec. 20	4,200 ft. 10-in. vitrified sewers	J. J. Armstrong, City Engr.
la.	Clarion	1 p.m., Dec. 20	Tile drainage ditch	F. E. Osler, Co. Aud.
O.	Cincinnati	noon, Dec. 21	Sewers in several streets	Chief Engr., Dept. of Public Service
Cal.	Waterford	Dec. 21	Constructing concrete syphon	C. C. Horsley, Sec. Irrigation District
La.	New Orleans	noon, Dec. 21	Constr. 3 12-ft. steel discharge pipes for drain. pumps.	G. G. Earl, Gen. Supt. Sewerage & Water Board
Minn.	Olivia	2 p.m., Dec. 22	Constructing tile drainage ditch, cost \$27,690	J. L. Johnson, Co. Auditor
Minn.	Glencoe	Dec. 22	63,600 ft. 8-in. to 24-in. tile drains	County Auditor
Ky.	Louisville	Dec. 22	84-inch sewer; cost, \$30,000	Board of Public Works
la.	Cresco	Dec. 22	17,480 feet tile drains; cost, \$20,000	E. A. Hoopman, Co. Aud.
Pa.	Erie	Dec. 22	Constructing storm water sewer system in connection with grade elimination; cost, \$24,112	F. G. Lynch, City Engr.
Ill.	Quincy	11 a.m., Dec. 23	Concrete sluice, 360 ft. long, 4x6 ft., and requiring 15 ft. of excavation	W. P. Bushnell, Chief Engr., Wells Bldg.
Va.	Roanoke	Noon, Dec. 26	Constructing sewers	F. L. Gibboney, City Engr.
Minn.	St. Paul	10.30 a.m., Dec. 26	Sewers in several streets	H. W. Austin, Pur. Agt.
Md.	Baltimore	3 p.m., Dec. 27	Septic tank and iron drains at immigration station	Supervising Archt., Treasury Dept., Washington, D. C.
Ind.	Indianapolis	10 a.m., Dec. 27	Constructing sewer in alleys	B. J. T. Jeup, City Engr.
Ill.	Rock Island	Jan. 2	Sewers and sewage treatment plant	Wm. McConochie, Mayor
Minn.	Elbow Lake	Jan. 3	Tile drain, 15 miles long	H. Dunaway, Engr.
Ind.	LaFayette	Jan. 24	8 1/2 miles 8 to 12-inch sewer	E. J. Vaughan, Clerk
Minn.	Crookston	Jan. 25	Excavating drainage ditches; cost, \$6,000	H. J. Welte, Co. Aud.
la.	Rockwell City	Feb. 5	Disposal plant; \$10,000 available	F. E. Burnham, City Engr.
Wis.	Chilton	Mar. 6	Constructing sewer system, cost \$22,000	Jerry Donohue, Engr., Sheboygan, Wis.
India.	Calcutta	2 p.m., June 1	Storm water pumping plant	C. C. Chatterjee, Sec. Corp. of Calcutta
WATER SUPPLY.				
D. C.	Wash'ton	10.30 a.m., Dec. 15	Furnishing centrifugal pumps and equipment	Gen. Purchasing officer, Panama Canal
N. C.	Clayton	Dec. 15	Constructing water mains	City Clerk
Ill.	Berwyn	Dec. 16	3 miles of 6-in. c. i. water mains	Bd. of Local Improvements
Man.	Winnipeg	noon, Dec. 18	Construction of 9.5 miles 5 ft. 6-in. reinforced concrete pressure pipe	R. D. Waugh, Chief Comr., 901 Boyd Bldg., Winnipeg, Can.
O.	Cayuhoga Falls	Dec. 18	Laying 17,000 ft. 4-in. and 6-in. water mains	E. D. Barstow, Engr.
Kan.	Moran	Dec. 18	Water and light plants; cost, \$42,000	W. B. Rollins & Co., Railway Exch. Bldg., Kan. City, Mo.
N. Y.	Yonkers	Dec. 18	Installing 3-million-gal. pump	Bd. of Contract & Supply
Mo.	El Dorado Springs	Dec. 19	Improving waterworks; \$20,000 available	C. P. Ryan, City Clerk
Ill.	Berwyn	8 p.m., Dec. 19	Cast iron and lead water supply and service pipe, two jobs	O. N. Lindahl, Sec. Board of Local Improvement
O.	Cleveland	noon, Dec. 20	Valves for water department	Comr. of Water
Md.	Indian Head	Dec. 26	Pumps, pipes, etc., for high pressure system at Naval Testing Station	Bur. of Yards & Docks, Navy Dept., Washington, D. C.
Pa.	Philadelphia	10 a.m., Dec. 27	Constructing 24-in. and 18-in. c. i. lines, excavating and trenching and constr. concrete reservoir	A. W. McCallum, Sec. 26, South 3d St., Philadelphia, Pa.
Ohio.	Lorain	Noon, Jan. 3	Six Jewell filters, valves, pipes, etc.	A. J. Horn, Dir. Pub. Service
Ind.	Ft. Wayne	2 p.m., Jan. 4	Roof over city reservoir	Board of Public Works
la.	Webster City	Jan. 8	Water and light plant; cost, \$18,000	H. G. Vollmer, City Mgr.
La.	Independence	Jan. 9	Oil engines, pumps, steel tower and tank, reservoir, pumping engine and station, hydrants, valves, pipe, etc.	W. H. Wilson, Mayor
Wis.	Chilton	Mar. 6	Constructing water works system, cost \$45,000	Jerry Donohue, Engr., Sheboygan, Wis.
O.	Mt. Vernon	April 1	Installing meters; \$20,000 available	C. G. Snow, Dir. of Pub. Serv.
MISCELLANEOUS.				
Ill.	Chicago	Dec. 15	Constructing rubble breakwater at Indiana Harbor, Ind.	U. S. Engr. Office, Fed. Bldg. City Aud.
Mass.	Fall River	Dec. 16	Collecting and disposing of garbage	H. H. Howe, Co. Aud.
S. Dak.	Sioux Falls	Dec. 16	Control gates and weirs for drains	W. A. Tucker, Co. Aud.
N. D.	Fargo	Dec. 16	Constructing drains, requiring 1,600,000 cu. yds. excav.	Lighthouse Inspector
N. Y.	Tompkinsville	Dec. 16	150-h. p. oil engine (marine) and 1 hoisting engine	Samuel Carr, Supvr. of Cons.
Ind.	Medora	2 p.m., Dec. 18	Constructing drainage ditches	O. A. Seward, Jr., Resident Engr.
Tex.	Beaumont	Dec. 19	Furnishing 4,000 feet 75-pound rails, rail equipment, switches, frogs, etc.	Co. Comrs.
Wash.	Seattle	11 a.m., Dec. 19	Constructing county docks; cost, \$15,000	Hunter & Morton, Engrs., Commercial Savings Bldg., Stockton.
Cal.	Tracy	Dec. 19	Irrigation intake canal, requiring 225,000 cu. yds. excav.	A. O. Hougum, Co. Auditor
Minn.	Moorhead	Dec. 19	Constructing drainage ditch	O. Halden, Co. Aud.
Minn.	Duluth	1.30 p.m., Dec. 20	Ditch construction	Comr. of Water
O.	Cleveland	noon, Dec. 20	Tunnel under subway	Central Bridge Commission
Mass.	Lawrence	2.30 p.m., Dec. 20	Laying tracks on bridge	T. A. Boyle, Market Clerk
N. J.	Newark	8.30 p.m., Dec. 20	Removing rubbish and garbage and snow and ice from the grounds of Center Market for one year	N. B. Barber, Co. Engr.
la.	Waterloo	10 a.m., Dec. 21	Furnishing 80,000 lbs. reinforcement steel	N. B. Barber, Co. Engr.
la.	Waterloo	2 p.m., Dec. 21	Kerosene, gasoline and tractor supplies	J. T. Fetherston, Comr. St. Cleaning
N. Y.	New York	Noon, Dec. 21	Removing snow and ice during the winter in Bronx Borough	Clerk, Co. Comrs.
Fla.	Jacksonville	10 a.m., Dec. 22	Canal, 50 feet wide and 6 feet deep	Park Engineer
O.	Cleveland	noon, Dec. 22	Sale of steam shovel	Bureau of Yards and Docks, Navy Department
D. C.	Washington	Dec. 26	One 80-ton bridge crane, three 15-ton bridge cranes, twelve 5-ton wall cranes and eight 3-ton wall cranes	City Clerk
Ill.	Berwyn	Jan. 1	Incinerator; \$12,000 available	M. N. Hazzard, 217 N. Bright St., Whittier
Cal.	Whittier	Jan. 1	Dam and irrigation system; cost, \$750,000. Includes 6,000 feet of tunnel and four miles pipe line or flume	E. D. Bass, Comr. Sts. & Sew's
Tenn.	Chattanooga	Jan. 2	Furnishing garbage incinerator	

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
Ind.	Huntington.....	3 p.m., Jan. 5..	Constructing drainage ditch.....	George Hoch, Drainage Comr.
O.	Columbus.....	noon, Jan. 15..	Sale of garbage tankage and grease.....	G. A. Borden, Pres., Board of Purchase.
Minn.	Henderson.....	Jan. 17..	Constructing two drainage ditches.....	F. Hoppenstedt, Co. Aud.
Minn.	Crookston.....	10 a.m., Jan. 25..	Constructing drainage ditch, cost \$6,000.....	H. J. Welte, Co. Auditor
South Africa	Johannesburg.....	Feb. 15..	Machinery for utilizing by-products at municipal abattoirs.....	Municipal Council.

STREETS AND ROADS

Beaverton, Ala.—The Lamar County branch of the Bankhead Interstate Highway Association was formed in this town for the purpose of constructing the link of road from Guin to Sulligent, in the proposed Bankhead highway from Birmingham to Memphis. Road will be built by private subscription.

Birmingham, Ala.—An ordinance fixing and establishing the grade of 26th St., south, and the curbs on both sides from the south curb line of Sixth Ave., south, to the north curb line of Eighth Ave., south.

Birmingham, Ala.—Ordinance for improvements on Ave. W. Ensley for the south property line of 29th St., Ensley, to the north curb line of Warrior road.

Birmingham, Ala.—An ordinance fixing and establishing the grade of First Ave. and the curbs on both sides from the east property line of 61st St. to the west property line of 62d St.

Bessemer, Ala.—City council decided to postpone paving of Second Ave. from 18th to 21st Sts. until spring.

Hot Springs, Ark.—City Council re-adopts Central Ave. paving ordinance over Mayor's veto.

Lake Village, Ark.—Highway bonds of \$250,000 is contemplated by the county.

Russellville, Ark.—The question of issuing \$100,000 road bonds an election will be held in the near future.

Douglas, Ariz.—City to let contract soon for 60,000 sq. yds. paving. G. W. Wood, City Engr.

Tucson, Ariz.—An appropriation of \$20,000 was made by the Pima county board of supervisors for the construction of a road from the Pinal county line, near Oracle, to the mining camp of the Daily Arizona Consolidated Mining Co.

Eureka, Cal.—The Eureka Development Association has passed resolutions asking the State Highway Commission to consider the construction of a highway lateral from Eureka, Humboldt County, to the Sacramento Valley through the Trinity National Forest.

Los Angeles, Cal.—City Engr. instructed to establish curb lines on Ivanhoe Ave., Rokeby St. and Rowena Ave. as recommended by him.

Los Angeles, Cal.—Ordinance adopted for the improvement of Ardmore Ave. from Fountain Ave. to Santa Monica Blvd.

Los Angeles, Cal.—Ordinance passed to grade and pave alley south of 14th St.

Los Angeles, Cal.—Plans and specifications for improvement work on Temple Ave., Catalina St. and other streets in Road District No. 4, were approved and clerk directed to publish notice calling for bids.

Sacramento, Cal.—Actual building of Sacramento County's \$1,750,000 highway system will be started by the middle of March, 1917, according to a statement made by Engineer Morton.

Sanger, Cal.—City intends grading and oiling and laying cement curbs and walks on 5 miles of streets.

Willows, Cal.—The Federal Forest Service will be asked to appropriate sufficient money from its 1918 funds to construct, with the assistance of Mendocino, Glenn and Tehama counties, the Round Valley road from the coast to the Sacramento Valley, according to F. L. Caughy of Mendocino.

Woodland, Cal.—The first step toward the building of a system of permanent county highways, connecting every town in the county with the county seat, was taken by the board of supervisors when they authorized County Surveyor Proctor to commence the preliminary surveys. A sum, not to exceed \$1,000, was appropriated to defray expenses of the survey. The vote was unanimous. Cost estimated at \$1,250,000.

Bridgeport, Conn.—Mayor in his message to Council makes several recom-

mendations: Extensions of Broad St. northerly to Bull's Head; John St. from West Ave. westerly to Park Ave., making it a through street. Favors establishing zones which will restrict the district, and further steps should be taken to carry out the sewage disposal scheme.

Hartford, Conn.—City plans to widen and pave Park St. R. N. Clark, City Engr.

Washington, D. C.—Recommendations of Commissioners for street work for 1917; following schedule: Northwest section, \$82,400; Southwest, \$27,500; Southeast, \$55,600; Northeast, \$54,300; Georgetown section, \$4,000.

Washington, D. C.—Commissioners request appropriation for paving of K St. northwest from 24th St.

Lakeland, Fla.—City will in the near future issue \$125,000 street improvement bonds.

Tampa, Fla.—Resolution passed by city council for paving of the south half of 26th Ave., between Nebraska Ave. and 15th St., and also between 22d and 13th Sts.

Tarpon Springs, Fla.—See "Water Supply."

Tampa, Fla.—Board of works decided to extend the brick paving on Twiggs St.

Grayville, Ill.—Plans being prepared by G. W. Coulter, Engr., Mt. Carmel, for paving 8 miles of streets.

Galesburg, Ill.—The board of local improvements is planning to pave Jefferson St. with brick on a concrete foundation. J. L. Conger, Clerk of Board of Local Improvements.

Waukegan, Ill.—Stewart St. will be paved; will be 25 ft. in width and include a combination curb and gutter of cement. The total estimated cost of the work, according to the figures of the city engineer, will be \$12,892.21. A total of 3,840 sq. yds. of creosoted paving will be laid, although Waukegan has a creosoted factory.

Brookville, Ind.—Gravel road bonds totaling \$6,470 were sold to the Fletcher American National Bank of Indianapolis for par and \$223 premium.

Cannelton, Ind.—Bids received Dec. 20, 1916, at 1 p. m., by treasurer of Perry county, for sale \$10,676 highway improvement bonds, 4½ per cent., 10 years. Lawrence P. Kelly, Treasurer.

Delphi, Ind.—Bids received Dec. 20, 1916, at 2 p. m., by Treasurer of Carroll county, for sale \$4,500 highway improvement bonds, 4 per cent., 10 years. W. H. Lesh, Treasurer.

English, Ind.—Bids received Dec. 20, 1916, at 2 p. m., by Treasurer of Crawford county, for sale \$3,300 highway improvement bonds, 4½ per cent., 10 years. A. H. Flanigan, Treasurer.

Fort Wayne, Ind.—The board of works has ordered the Moellering Construction Co. to start the city's work at Osage St.

Greenfield, Ind.—Bids will be received for road work. The specifications include one mile of stone road and 3 miles of gravel road. Address County Engineer G. C. Winslow.

Greencastle, Ind.—No bids received for county road work. J. M. Allen, Co. Aud.

Indianapolis, Ind.—Resolutions adopted: Bradbury St. from Garfield Drive to Shelby, cement walks and curb and grade and gravel; Ringgold St. from Raymond to Garfield, grade and gravel, curb and cement walks.

Laporte, Ind.—The Fletcher American Natl. Bank of Indianapolis, paid a premium of \$988 for road bonds amounting to \$28,800. J. F. Wild & Co. of Indianapolis bought a \$12,800 issue for a premium of \$441.50. The bonds bear 4½ per cent interest. Other Indianapolis bidders were Meyer-Kiser Bank, Breed Elliott & Harrison, and R. L. Dollings Co.

New Albany, Ind.—Samuel T. Mann, City Engr., was directed to prepare plans and specifications for a vitrified

brick intersection at East 7th and Oak Sts., the terminal of the vitrified brick improvement on Oak St.

Newport, Ind.—Bids received Dec. 23, 1916, at 10 a. m., by treasurer of Vermillion county, for sale \$3,500 highway improvement bonds, 4½ per cent., 10 years. J. Clark Smith, Treasurer.

Noblesville, Ind.—Gravel road bonds amounting to \$820 was sold to the R. L. Dollings Co., of Indianapolis, at par, accrued interest and a premium of \$20. The Fletcher American National Bank, of Indianapolis, bid a premium of \$15.

Shelbyville, Ind.—The council accepted a petition asking for curb and gutters and cement walks in Worth St., from Broadway to South St. The resolution ordering the improvement will be taken up at a later meeting.

Rensselaer, Ind.—Bids received Dec. 21, 1916, at 1 p. m., by treasurer of Jasper county, for sale \$50,000 highway improvement bonds, 4½ per cent., ten years. Chas. V. May, Treasurer.

Chanute, Kan.—City will soon receive bids for macadamizing roads. C. Pratt, City Engr.

Wichita, Kan.—Resolution declaring it necessary to excavate, curb, gutter and pave Chatfield Pl. from the east line of Rutan Ave. to the west line of Clifton Ave. City engineer to make a detailed estimate of the cost.

Wichita, Kan.—An ordinance authorizing the repaving of the intersection of Fountain Ave. and Second St., and directing the city engineer to do this work.

Wichita, Kan.—Resolution declaring it necessary to excavate, curb, gutter and pave First St., from the east line of Hillside Ave. to the west line of Yale Ave., and Circle Drive from the south line of Waterman St. to the east line of Roosevelt Ave. City engineer to make a detailed estimate of the cost.

Irvine, Ky.—Street improvement bonds were successful at recent election.

Louisville, Ky.—Resolutions providing for grading of the Western parkway, between Broadway and Greenwood Ave., and between Paddy's Run and Third St., were adopted at a meeting of the Board of Park Commissioners.

Crowley, La.—An election Dec. 30 to issue \$400,000 road bonds. Secretary Police Jury. D. W. Thibodaux.

Lake Charles, La.—Property owners in North Ryan St. have petitioned the Commission Council for vertical fibre brick paving with a pavement 36 ft. wide.

Great Barrington, Mass.—Bd. of Pub. Works accepted the bid of Blodgett & Co. of Boston for the serial bonds held by the Berkshire County Savings Bank of Pittsfield. Serial notes of \$2,000 each payable yearly will now be issued at 4 per cent. The superintendent of the district has been instructed to lay two new cross walks on Taconic Ave.

Lowell, Mass.—Municipal council Dec. 13, Commissioner Charles H. Morse will introduce an order for the laying of concrete sidewalks on both side of White St., Pawtucketville, from Second Ave. to Riverside St.

Lynn, Mass.—Council voted \$15,000 to pave Commercial St. and \$15,000 to pave Western Ave. and Floating Bridge. W. L. Vennard, City Engr.

New Bedford, Mass.—For improving highways council appropriated \$53,000. G. W. Wye, City Engr.

Waltham, Mass.—Orders were reported by the public works committee for a concrete walk in Parmenter road and for \$5,575 for the layout of West Dale St. The orders were passed to second reading.

Laurium, Mich.—Concrete highway Red Jacket and Laurium considered by township highway officials. G. Martin, Clerk.

Minneapolis, Minn.—Committee on paving acted favorably on the proposal to extend a 30-ft. pavement along Washington Ave. beginning at Lyndale Ave.

north and 42d St. as far as 44th St., on 44th St. to the Osseo road and on this road to the city limits, will be recommended to council. Creosote block pavement under the provisions of the Elwell law was recommended by the assistant city engineer.

Minneapolis, Minn.—A 150-ft. boulevard to parallel Seventh St. north and to extend from the downtown district to North Minneapolis, is under consideration by the park board.

Fort Gibson, Miss.—Ordinance adopted and bids will be received on \$20,000 bonds in January for the concreting of practically all of the sidewalks in town.

Richton, Miss.—Board of supervisors of Perry county issued good roads bonds in the sum of \$200,000. The bonds were sold immediately to a firm in Toledo, O. An engineer will prepare plans and specification and work will begin as soon as these plans can be approved. The four routes chosen are as follows: The two north and south roads will pass, one through Rhodes, Richton and Beaumont, and the other by way of Runkellstown and New Augusta. The two running east and west will be, one from Forest county, down Leaf River, by way of Beaumont and Lucedale, and the other from Hattiesburg via Richton, Leakesville and to Mobile.

Chillicothe, Mo.—City engineer to prepare plans and specifications for paving of Ninth St., between Vine and Broadway with brick and asphalt filler.

East St. Louis, Mo.—Board of Local Improvement advertising for bid for improvement of Missouri Ave. from Relay depot to Tenth St., cost \$60,000.

Joplin, Mo.—Resolution to grade, sub-grade and pave, at grade, the roadway of 6th St. from the east line of Virginia Ave. to the west line of Kentucky Ave., with two-course concrete pavement.

Salem, Mo.—Election in January for \$160,000 road construction bonds. James H. McDonald, County Clerk.

Great Falls, Mont.—The election resulted in favor of issuing of \$200,000 road bonds.

Hamilton, Mont.—Chamber of Commerce adopted resolutions favoring construction of road from Bitter Root to Anacana. Ravalli County Good Roads & Automobile Assn. will co-operate.

Grand Island, Neb.—Narrow paving is chosen for West First St.

Omaha, Neb.—City council may pass before spring an appropriation for the boulevard system from Riverview to Sprinklake and Mandan Parks, as planned by city engineer.

Atlantic City, N. J.—Notice of intention to introduce an ordinance to provide for the extension of Horace Ave. eastwardly to Illinois Ave.

Rutherford, N. J.—For improving portion Park Ave., town commissioners appropriated \$12,867. R. M. Watson, City Engr.

Albany, N. Y.—Ordinance passed (Alderman Knapp) for the curbing and surfacing with concrete the intersection between Western and Madison Aves. at Allen St.

Albany, N. Y.—Alderman Gunn introduced ordinances providing for the widening of Manning Blvd. at the intersection of Washington Ave., and authorizing the City Engr. to exchange his old automobile for a new one.

Albany, N. Y.—Delegation of supervisors and highway superintendents had a conference with Highway Commissioner Edwin Duffey on highway improvement in Suffolk county. The board of supervisors ask that the state highway be built from Moriches to East Moriches. The department also was urged to push the improvement of the Islip road.

Albany, N. Y.—The Delaware Avenue Section Improvement Association favored wood blocks for the repaving of Delaware Ave.

Albion, N. Y.—The board of supervisors of Niagara and Orleans counties are considering a resolution for a survey of county line road. This road is 8½ miles long and extends from Route 30 to Lake Ontario, and the plan is for each county to pay one-half the cost.

Auburn, N. Y.—The plans for the Weedsport-Jordan road have been completed and approved. This will complete Trunk Line 20, across Cayuga County, and a force of state engineers are now surveying and planning for the road across the marsh, west of Montezuma in Seneca county.

Cohoes, N. Y.—Alderman Perreault, representing the Sixth Ward, appealed to the Mayor, members of the board of Estimate and Apportionment and the

Aldermen to see if some plans could not be devised to have Park Ave., from Ontario St. south to Bridge Ave. paved.

Goshen, N. Y.—Board of Supervisors approved for improvement of the road through Washingtonville village, about two miles in length, to connect the improved roads to Vails Gate on the east and Chester on the west. The county's share of the cost of the improvement will be \$12,005.

Hudson, N. Y.—Board of Supervisors appropriated about \$4,200 for the completion of the Hollowville-Craryville state road, which has been under construction since 1913.

Newburgh, N. Y.—Petitions for improvement of Balmville Rd. has been forwarded to Edwin Duffey, State Commissioner of Highways, asking that the road be permanently improved with brick or concrete.

Ogdensburg, N. Y.—Resolution for opening Allen St. carried.

Syracuse, N. Y.—A program for the construction of new county roads and for the repair and maintenance of roads now in existence, calling for the expenditure of \$192,300 during the coming year, was adopted by the Board of Supervisors yesterday on a resolution introduced by Supervisor Harley J. Crane, chairman of the Highway Committee. Camillus, \$1,500; Cicero, \$5,000 and \$57,000 for the South Bay-Bridgeport road; Clay, \$3,000; DeWitt, \$5,000 and \$7,850 for permanent improvements; Elbridge, \$2,000; Geddes, \$300; Lafayette, \$2,500; Lysander, \$5,000 and \$35,000 for the Little Utica-Plainville road; Manlius, \$4,000 and \$24,700 for the Lyndon-Manlius road; Marcellus, \$1,000; Onondaga, \$5,500 and \$5,000 for the Onondaga Hill road; Pompey, \$3,500; Salina, \$1,500; Skaneateles, \$1,500; Tully, \$18,000 for the Tully Lake road, and Van Buren, it is for \$3,500. Where the purpose of the appropriation is not given in the above schedule it is for maintenance, oiling and general repairs.

Troy, N. Y.—Special meeting of Melrose Grange in that village a movement for "better highways for horses" was launched. Discussed particularly the road between Melrose and Troy, but it is understood that the granges throughout the state are to take up the matter from time to time. A committee was named to investigate the best kind of a road to recommend and it will report at a meeting to be held December 18.

Grafton, N. D.—For road and bridge work next year. Walsh county plans to spend \$14,000. W. C. Treuman, Grafton, Aud.

Roswell, N. M.—Petition asking for election to vote \$100,000 road construction and repair bonds. Address County Clerk.

Cincinnati, Ohio.—Ordinance to establish grade of Monteith place, from a point 37.50 feet north of the north line of Mortin's estate to Linwood Ave.

Cleveland, O.—Nearly 50 miles of streets are included in a paving program for 1917, completed by Public Service Director Alex Bernstein. Ordinances authorizes the repaving of the following streets have been passed by Council: Broadway S. E., Clark Ave. S. W., Cedar Ave. S. E., Euclid Ave., Mayfield Rd., East 9th St., East 65th St., East 69th St., East 77th St., Denison Ave., Lakeside Ave. N. E. and N. W., East 24th St., East 40th St., East 89th St.

Defiance, O.—Members of city council passed city ordinances providing for the issuance of \$64,000 of city 4½ per cent. bonds to pay the expense of paving four thoroughfares. Juliet, Jackson, First and Third Sts. The contracts will be let this winter.

Hamilton, O.—A committee to wait on the government with a proposition for the construction of a permanent highway, 24 ft. wide, from Hamilton to Niagara Falls, has been appointed by Winona District Improvement League.

Lima, O.—Resolution to improve Ontario St. from Metcalf St. to McDonald St. by paving.

Napoleon, O.—Henry county commissioners awarded a series of road improvement bonds aggregating \$11,640 and bearing 4½ per cent. interest to the Provident Savings Bank & Trust Co., of Cincinnati, at a premium of \$76.82 and accrued interest.

Arapahoe, Okla.—Road bond issue, \$800,000 election Jan. 15.

Chickasha, Okla.—Carrying out plan agreed upon at the good road meeting Nov. 27, a committee composed of J. E. Schow of this city, Barker Riddle and Henry Milleur of Rush Springs, has pre-

pared petitions for a county bond issue of \$1,000,000 for hard surface road.

Commerce, Okla.—The local town trustees have passed an ordinance authorizing the mayor to call an election for the purpose of voting on the question of granting a franchise to J. R. Rose of his successors for an interurban road. This line would extend from Columbus, Kan., to Picher and Commerce, Okla., through the heart of the mining district of northeastern Oklahoma and southeastern Kansas. Work has already been started and surveys have been made from Columbus.

Curtis, Okla.—To build roads Curtis township will vote on bonds in December.

Blachly, Ore.—The taxpayers of Road District No. 39 met to discuss road matters and to vote a 5-mill special road tax for the purpose of continuing the distribution of rock over the district and to otherwise improve the roads.

Eugene, Ore.—B. F. Finch, Sr., engineer, forest service, reports that between \$7,000 and \$10,000 will be spent by the government for the improvement of McKenzie Pass road.

Beaver, Pa.—The ordinance providing for the establishment of a grade on Main alley, between Sixteenth and Seventeenth streets, passed first reading.

Ebensburg, Pa.—An effort is being made by a number of gentlemen interested in better roads for Cambria County to have the principal highways leading to State roads taken over by the county and improved jointly by the county and townships. It is hoped, by this means, eventually to connect most of the boroughs of Cambria County with the system of State roads.

Erie, Pa.—The first part of the grading, from 26th St. to the Mill Creek line at 28th St., will be done early in the spring, at a cost of less than \$500.

Pittsburgh, Pa.—City plans to pave and curb Eureka St. for about \$12,500 and Smith Way, \$13,000. R. Swan, City Engr.

Smithport, Pa.—McKean county voted \$750,000 bonds for constructing hard-surface roads.

Warwick, R. I.—For road building town voted \$16,000 bonds. J. T. Lockwood, Apponang, Town Clk.

Sumter, S. C.—Petitions to pave under the abutting property ordinance Church St. from Broad to Peach and Haynsworth St. from Church to Salem, ordered filed.

Austin, Tex.—George D. Marshall, Federal highway engineer, now acting as state highway engineer in Texas, has just completed a report of an inspection, with recommendations, for a system of market roads for Brown County.

Canyon, Tex.—Randall county plans for an election to vote \$100,000 road bonds. The move is a step toward obtaining the Ozark Trail through Canyon.

Columbus, Tex.—Election Jan. 16, 1917, in Road Dist. No. 1 to vote \$100,000 road bonds. Address County Clerk.

Dallas, Tex.—City grants petitions for paving Leonard St., between San Jacinto and McKinley Ave., with bitulithic; Ninth St., between Fleming and Ewing, with bitulithic; Ann St., between Stonewall and the Gulf, Colorado and Santa Fe Railroad tracks, with asphalt, and Watt St., from Bank to Christler, with vibrolithic.

Fort Worth, Tex.—A petition to grade and gravel Prairie Ave. from 25th St. to 26th St. were referred to the street commissioner, the city engineer and the city attorney.

Fort Worth, Tex.—Dec. 19 was set by the city commission as protest day for the paving of Travis Ave. from Pennsylvania to Terrell Ave. and the paving of Washington Ave. from Carlock St. to Jessamine St.

Houston, Tex.—New county commission ordered missing link in the Harrisburg Blvd. paved. Also two blocks of Washington Ave. City will pay one-half of cost and the county not to exceed \$19,500. At the same time three country roads were ordered paved. Clinton road on the Ship Channel, the Kuykendall road in the northern portion of the county and the Goose Creek Oil Field road.

Houston, Tex.—Council ordered the laying of sidewalks on both sides of House St. from San Felipe to Hardcastle.

Houston, Tex.—Plans for different methods of repaving the North Main St. tunnel, that will cost from \$37,000 to \$87,000, were submitted to the city council by Southern Pacific engineers. The city will determine which plan is to be

used and negotiations concerning the disposition of the cost will then be opened.

Lockhart, Tex.—Delhi District \$5,000 road bonds carried at recent election.

Wellington, Tex.—See "Water Supply."

Salt Lake City, Utah.—That an automobile road should be built at government expense from Bluff, Utah, to the natural bridges, in the vicinity of the Mesa Verde national park, will be the recommendation of H. Stanley Hinricks, in charge of the local field division of the United States Land Office, to the commissioner of the general land office and to the secretary of the interior. Distance is about 60 miles and the proposed road will cover the old Mormon trail to the monuments.

Charlottesville, Va.—Highway from Nortonville to Charlottesville, including bridge over Lynch River, considered by Albemarle county. Address J. M. Frye, Charlottesville.

Norfolk, Va.—Commissioners of roads and bridges of Norfolk county decided to purchase a new road roller and a scarifier for use in improving the macadam roads of the county.

Norfolk, Va.—Bearing the signatures of a number of Portsmouth residents and members of the Auto Association a petition asking that smooth paving replace the cobble stones on Water St., between Queen and London Sts., will be presented to the Portsmouth city council. The directors also adopted a resolution asking the Norfolk city engineer to place broken stone over the entire length of Olney road extended, to improve Blow St. and the intersections of Bute and Dunmore Sts., and of 28th and Gazelle Sts.

Parsons, W. Va.—Election Dec 29 to vote the following road bonds: Davis district, \$98,000; Dry Fork district, \$60,000; Fairfax district, \$150,000.

Bellingham, Wash.—Plans for improving Cornwall Ave., providing for 42-ft. pavement from Champion to Kentucky Sts., and 31-ft. pavement from Kentucky to North Sts., before council.

Seattle, Wash.—Plans submitted, Avalon Way, paving, Res. 5401. Est. cost, \$7,000.

Eau Claire, Wis.—Question of issuing road improvement bonds to amount of \$750,000, an election will be held in the near future.

Monroe, Wis.—County contemplating issuing \$650,000 highway bonds.

New London, Wis.—For paving portion of Wyman St., concrete, city receiving bids in December. T. R. Roberts, Court House, Green Bay, Engr.

Rhineland, Wis.—About \$43,000 Oneida county plans to spend on road work next year. J. Verage, Rhineland, County Clerk.

Shawano, Wis.—\$200,000 road bond issue will be voted in the near future.

Sheboygan, Wis.—Petition for paving North 15th St. from Lincoln Ave. north was presented to council.

Tomah, Wis.—Fifteen blocks of streets here are to be paved in brick, the common council decided. The streets to be bricked are McLean Ave. from Clifton St. to Washington St., and Washington St. from McLean Ave. to Superior Ave. Thirteen blocks on Kilbourn Ave. are to be paved with reinforced concrete. Over a thousand feet of brick road is to be laid on Superior Ave. south from Dr. Kyle's farm towards the town line.

Waukesha, Wis.—Council recommended permanent improvement of following streets deferred another year: Baxter, Buckley and Oak Sts., Woodward, Central and West Aves. Council will proceed with the improvement of Elizabeth, Fulton, Colton Sts. and part of Woodward Ave., to give thoroughfare to the Jiffy-Jell Co.'s plant. Water, sewer and gas service piping have been ordered.

Delta, B. C.—For the proposed road from the Reit road to the American boundary around English Bluff. MacDonald & Burnett, of New Westminster, have completed the survey. N. McDiarmid, Clerk.

North Vancouver, B. C.—By Acting Engineer Clwas improvement to Keith road, at cost of \$8,450, has been recommended to city council.

Elgin County, Ont.—Plan for twp. roads were voted down by County Council.

Lindsay, Ont.—Good roads movement has been adopted by Victoria county and immediately after the war will expend \$25,000, of which the government will provide 40 per cent.

Niagara Falls, Ont.—Mayor Clendenning and Alderman Dixon were appointed a committee to take up the project

to widen Queen St. fifteen feet in the block between Erie Ave. and Ontario Ave.

Ottawa, Ont.—A. T. Macallum, Works Commissioner, will prepare plans for the opening of Lyon St., across the G. T. R. tracks.

Ottawa, Ont.—Ottawa-Prescott highway is to be built of concrete is reported.

Preston, Ont.—From the Speed Bridge to the Del Monte Hotel, a permanent pavement may be laid on main street next year. H. C. Edgar, Town Clerk.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Burbank, Cal.—*E. Schelling, improving Santa Anita Ave., let by city.

Tulare, Cal.—Federal Construction Co., Sharon Bldg., San Francisco, city street paving contract, \$19,900.

Watts, Cal.—For improving portion Wall and Ann Sts., and Queen Ave. E. S. Croshong, Box 222, Burbank; bid \$6,311.

De Land, Fla.—*F. G. Proudfoot for the construction of about nine miles of 9-ft. roadway, to be of asphaltic block and extends from Tiger Bay to Daytona, being the Daytona end of the De Land-Daytona highway.

De Land, Fla.—Board of public works let contracts for street paving and curbing to the *Wilson Construction Co. and the *Southern Clay Mfg. Co. for the construction of about four miles of cement grouted brick street, ranging in width from 20 to 35 ft., for about eight miles of concrete curb, 4x14, to *N. N. Jacobs, a home contractor, at a price of 21 cts. per lin. ft.; also gets the contract for all concrete work in connection with the city paving, except of course the cement grouting, which is a part of paving contract.

Springfield, Ill.—State Highway Commission Nov. 28 awarded for State aid work in Woodford County, Section C, D and E type oiled earth to *John Brogen, Eldred, Ill., for \$5,426.15, \$10,252.71 and \$14,950.06.

Connersville, Ind.—The contract for construction of a gravel road in Posey township, Fayette county, to *Geo. M. Hoppes, of Anderson, Ind., for \$17,944.

Indianapolis, Ind.—Public works let local sewer in Minnesota from 210 feet east of Churchman east to 100 feet west of Keystone, to *Columbia Construction Co.; Belmont Ave., from Washington to Oliver Ave., asphalt, to *Union Asphalt Construction Co.; Belmont Ave., from Michigan to Washington, asphalt, to *American Construction Co.

New Albany, Ind.—*John Howe was awarded the contract for the improvement of DePauw Ave., at \$2.35 a ft.

Rensselaer, Ind.—Bids received Dec. 5th for gravel road in Jasper County, *I. W. Moneyham & Son, Monticello, Ind., \$48,524.35. J. P. Hammond Co., auditors.

Shelbyville, Ind.—The county commissioners awarded the contract for the construction of the Armstrong road in Moral township to *Sexton & Bolt. The road is 2 1/4 miles long.

Vincennes, Ind.—For construction of 7,128 ft. gravel road, *C. W. Beard, Oaktown, Ind.

Warsaw, Ind.—The contract for the construction of the A. A. Orn road in Van Buren township let to *Hutton-Harris Construction Co., of North Vernon, at \$35,618. The other bids submitted were: I. J. Waller, Huntington, \$36,549; Kernodle & Miller, Lebanon, \$36,800; J. R. Bowlin, Tipton, \$37,500. The road is about 500 feet less than 3 miles in length and is to be constructed of concrete.

Corbin, Ky.—*Mason Construction Co., Emanuel, \$36,510, 17 miles roads let by county.

Henderson, Ky.—*C. K. Browder secured contract let by city for Riverside Driveway, \$10,000.

Hagerstown, Md.—*Harry W. Kaylor, of Hagerstown, has secured a contract to build about 4 miles of improved road in and around Keyser, W. Va. Approximately \$85,000.

East St. Louis, Mo.—See "Sewerage."

Maplewood, Mo.—*Carbon Construction Co., at \$4,000, for brick paving on concrete and sand base in Lanham Ave., from Manchester to city limits. M. F. O'Brien, City Clerk.

Havlock, Neb.—Bids received Dec. 1 for brick paving, cement foundation, *Able Construction Co., Lincoln, Neb., at \$2.10 per sq. ft.

Rochester, N. Y.—Board of Contract and Supply, the contract for an asphalt pavement in Marshall St., to Whitmore, *Raubert & Vicinus, \$18,281.60; for an asphalt pavement in Howell St., Rochester Vulcanite Pavement Company, \$15,757.25.

Napoleon, O.—A joint Henry-Fulton county road, known as the Glanz road, let to *O. L. Smith, of Leipsic, \$6,211.29, and a Henry-Wood county project, known as the Watkins road, to *Gaghan, McClure and *Strohl, of Custar, for \$15,213.29.

Norwalk, O.—*The Modern Construction Co., Fremont, has been awarded the contract for the New Medina road, five miles long, through Norwalk, Townsend and Hartland Townships, at \$98,807.55.

Norwalk, O.—*A. J. French of Wake-man, for the construction of the Butler road, county commissioners. The contract calls for three miles of concrete road, making a total in Huron county of 135 miles of roads built to date.

West View, Pa.—*Austin & Mathew, about 800 ft. grading Amherst Ave., Kenyon and Ann Arbor Aves. Private plans. C. A. McClain, Boro. Clk.

Portsmouth, Va.—Commission on roads and bridges of Norfolk county awarded to *J. U. Addenbrook to construct part of the Churchland Blvd., a distance of about three-quarters of a mile; price \$8,000.

Bellingham, Wash.—*Riddle & Hawkins received contract for improving Whatcom St. with concrete walks, between Ellis and Humboldt Sts.

Mount Vernon, Wash.—*Skagit Construction Co., Mount Vernon, Wash., one-course concrete paving, 7,278 sq. yds. excavation, hardpan and gravel, 2,300 cu. yds., \$1.60 paving per sq. yd.; excavation, 80 cts. per cu. yd., amount \$18,476.55. Bidders Henry J. Kaiser Construction Co., Everett, Wash., \$1.65 paving per sq. yd., excavation \$1 per cu. yd., \$18,864.90; G. Argentiari Co., Seattle, Wash., this bid declared irregular, \$1.30 paving per sq. yd., excavation 70 cts. per cu. yd., \$16,754.65. The total amount of bids as given includes concrete curb, curb armor, catch basins, extra inlets, overhaul, concrete walks and monument cases. L. J. Confield, City Engr.

Wellsburg, W. Va.—*C. T. Hamilton, Inc., Franklin, Pa., at \$800,000, for three miles brick roadway with concrete curb in Short Creek River road and Bethany Pike, Wellsburg. Contract let by Commissioners of Brooke county, H. C. Brashers, Clk. C. E. Eichelberger, Engr., Court House, Wellsburg.

Manitowoc, Wis.—For changing of grade and improvement of Lake and North Fourth Sts., by council to *Henry Meisner for \$3,349.95.

Toronto, Ont.—For the annual supply of refined asphalt, *Imperial Oil Co., at \$14 per ton in tank cars and \$18 per ton in barrels.

Toronto, Ont.—*Orsing & Co., by board of control for grading of Mossom road.

SEWERAGE

Los Angeles, Cal.—Ordinance of intention adopted for sanitary sewer work in Fountain Ave. and Seward St. district.

Sacramento, Cal.—Resolution passed for construction of sewers in Block 4, Boxler Tract, and alley first south of Park Ave.; also 38th St.

Bridgeport, Conn.—See "Streets and Roads."

Washington, D. C.—Several projects are proposed by the sewer department for the new year. Purchase of a site for a sewerage treatment works, \$40,000; for continuing the construction of the upper Potomac interceptor \$85,000 is asked, an increase of \$55,000.

Tampa, Fla.—A new sewer on Parker St. is under consideration.

Tampa, Fla.—It was decided to make a test of the pavement on South Newport Ave., to extend a sewer lateral to North Florida Ave. and build a sewer lateral on Harrison St., near Central.

Tarpon Springs, Fla.—See "Water Supply."

Lafayette, Ind.—The plans and specifications for the laterals ranging from the main trunk line of the Sixth Ward sewer were approved and adopted by the board of works. Plans were proposed by City Engineer Overesch.

Mishawaka, Ind.—The Bd. of Public Works confirmed resolution ordering a sewer constructed on Home St.

Shelbyville, Ind.—A new start was made by city council in the plan to construct a sewer along Tompkins St. from

Polk St. to Blue River and the resolution ordering the improvement was primarily adopted. From the river to Jackson St. the sewer tile is to be 42 ins. in diameter and the rest of the way to Polk St., 36 ins. All laterals are to be 16 ins. in diameter.

West Union, Ia.—City council taken preliminary steps toward extending sewer system to serve the entire town. Plan calls for another septic tank and mains. G. A. Blunt, county engineer, has drawn plans. Hearing on objections will be held by city council Jan. 2 and to consider for advertising for bids.

Louisville, Ky.—Bids for construction of 7-ft. sewer in Preston St., between Fulton St. and the river, will be opened in December. Estimated cost \$30,000.

Lowell, Mass.—Commissioner Morse will introduce an order for the laying of a sewer up Varnum Ave. from Dunbar Ave. to drain the new contagious hospital which is in process of erection. As planned, about 1,900 ft. of the sewer, 18-in. pipe, will be laid on Varnum Ave., 650 ft. 12 in. pipe will be laid through land now owned by H. Rule, and over 1,200 ft. 12-in. pipe will be laid on the hospital land owned by the city. The line of the sewer will follow a natural valley and the average depth will be about 15 ft. The estimated cost is about \$25,000. The sewer will be so constructed that drains can easily be run into it from any buildings that may be erected in the hospital land area for the future.

Reading, Mass.—A \$100,000 sewer system voted by town. F. A. Barbour, 73 Tremont St., Boston, Engr.

Grand Rapids, Mich.—The report of the second sewage disposal junket committee has been prepared and will go to the council. Concludes that further investigations of the sewage disposal matter be made by the board of public works and the engineering department and that they co-operate with Wyoming township in any suggestions which may be offered at any time. The report also concurs in the first report submitted by the original junket committee Sept. 25.

Ironwood, Mich.—Estimates will be made by the proper city officials for the cost of making soundings and tests of the ground which will be traversed by the new proposed trunk line sewer for the city.

St. Paul, Minn.—Final orders were adopted for sewers on Congress St. between Bancroft St. and Brown Ave., to cost about \$1.78 a front ft.; on Saratoga St. between St. Clair St. and Jefferson Ave., to cost about \$1.25 a ft., and on Middleton Ave. between Vista and Rogers Aves., and Rogers Ave. between Middleton Ave. and Race St., to cost about \$1.87 a ft.

St. Paul, Minn.—Council voted to install the proposed Arch St. relief sewer, which was planned originally by the old Board of Public Works. It will be constructed on the line of Arch St. across private property between Columbia and L'Orion Sts.; cost will be about \$850.

Carl Junction, Mo.—Contract will be let in about 60 days for constructing sewer system. A. W. McDowell, City Clerk.

Stevensville, Mont.—Council decided to take no action re-establishing sewer system.

Bernardsville, N. J.—Richard V. Lindabury has offered to give \$10,000 toward the cost of providing this place with a sewer, according to a statement made by Fred E. Ballentine at a meeting of the Bernards Township Board of Health. The offer was made provided some of the Mountain people contributed \$20,000.

Newark, N. J.—A proposed supplemental contract was sent by order of the Passaic Valley Sewerage Commission to the fifteen municipalities in the trunk sewer project and to five additional municipalities that have made application for entry. These provided they sign with the consent of those already in the agreement. Commission will receive \$912,562, enough to enable resumption of work on idle construction sections.

Albany, N. Y.—Ordinance passed (Alderman Schick), for laying sewer in Third Ave. from Tunis St. to about 400 ft. east of South Hawk St., and for laying sewer in Hoffman Ave. from McCarty Ave. to Mountain St.; Alderman Visscher, for laying sewer in Swan St., from State St. to Washington Ave.

Auburn, N. Y.—Resolutions by Alderman Swart were adopted directing City Engineer Bergen to prepare plans and specifications for a sanitary sewer in

Bellevue Pl. and a map for the renumbering of Arlington Ave.

Huntington, N. Y.—Sewer system bonds of \$25,000 has been authorized by town board.

Niagara Falls, N. Y.—City Manager Carr presented to the council a modified list of improvements necessary to be made next year. Tunnel in Second St. from the present trunk tunnel in Niagara St. to a point about 20 feet north of the south line of Falls St., for the relief of Falls St. Sewer across the lands of Niagara Falls Power Company from Royal Ave. to Buffalo Ave., and in Buffalo Ave. from Iroquois St. to Union St. An open ditch across the lands of the Niagara Falls Power Company, along the east line of Union St., extended northerly from Royal avenue to Pike creek. Sewer in Twenty-fourth St. from Ferry Ave. to Cleveland Ave.; a sewer in Fifteenth St. from Calumet Ave. to Center Ave., and a sewer in Center Ave. from Fifteenth St. westerly for a distance of 525 feet. The city engineer has estimated the cost of the above mentioned sewers at \$238,000. The council took no action.

Ogdensburg, N. Y.—A communication requesting building of a sewer at Spruce St. and Ford Ave. was referred to the Street Committee.

Wilmington, N. C.—Mayor Moore recommended that sewer pipe should be laid at once in Meadow St., between Eighth and Ninth and Orange and Dock.

Langdon, N. D.—Establishing an adequate sewage system is being considered by the city council.

Amherst, O.—Sanitary sewer system in West Martin Ave. and West Side voted by village.

Cincinnati, O.—Resolution to improve by sewerage Dover St. from Morgan St. to Wayne St., and Wayne St. from Dover St. to C. L. & N. Railroad.

Toledo, O.—The service director will borrow \$9,500 to finish preparing plans for the Ten-Mile Creek intercepting sewer. Five engineers are working on the plans and the improvement will cost approximately \$750,000. A list of all the streets to be paved and sewers to be built was submitted to the finance committee by City Engineer McClure. He asked that the council determine what improvements were to be made next year so bonds can be issued. The matter was laid over for a week.

Maumee, O.—Bids received at Village Clerk's office Jan. 2, 7:30 p. m., for purchase of bonds as follows: For construction of sewer in Alley North of Harrison Ave. bonds amounting to \$2,920, consisting of one bond of \$520 and four bonds of \$600.

Wauseon, O.—Town is to have a complete sanitary sewer system. The plans, prepared by George Champe, civil engineer, of Toledo, have been approved by the state board of health, with provision for the installation of a sewage treatment plant at the outlet during or previous to 1918; also will prepare plans for the sewage treatment work.

Catawissa, Pa.—James C. Brown, of Bloomsburg, will be retained by the borough to prepare estimates on sewage disposal plant.

Eric, Pa.—Street Director Kinney will introduce a bill calling for construction of a sanitary sewer system under the crossing on the west side of Parade St., to replace the line now laid in the center of the street. This work is estimated to cost \$3,200.

Eric, Pa.—City Engr. Lynch now preparing plans and specifications for the new sewer system, and it is being designed to drain the subways effectively.

McKees Rocks, Pa.—Architect John H. Phillips of McKees Rocks has been commissioned by the Government to get a survey and furnish information relative to street grades, sewers and street car lines and make needed tests that a conclusion may be reached for the proper loading and placing of foundation for the proposed \$100,000 Federal building, to be located on Chartiers Ave.

Punxsutawney, Pa.—Council authorizes ordinance for construction of a surface water sewer to relieve the Findley St. sewer and prevent the periodical flooding.

Everett, Wash.—Proposition to construct sewer in alley between Hoyt and Rucker Aves., from 21st to 19th Sts., postponed until March 1, 1917.

Spokane, Wash.—City may construct a new \$150,000 trunk sewer in the downtown district next spring. The new trunk is planned to be constructed of brick and concrete, will be egg-shaped,

5 ft. high and 3 wide, permitting it to be flushed with a small amount of water. **Milwaukee, Wis.**—City will spend \$1,460,000 for new sewers in 1917. Plans for this are now being prepared by the Sewerage Commission. Ordinances will be introduced calling for bond issues.

Waukesha, Wis.—Provision was made for the construction of a \$4,000 storm sewer in State, Hamilton and Franklin Sts. and College Ave. Bids will be let in a few days.

Trall, B. C.—See "Water Supply."

Dartmouth, N. S.—See "Water Supply."

Winnipeg, Man.—Construction of sewer and water main in Centennial St., between Academy road and Kingsway, was decided by city council; cost, \$6,037. W. P. Brereton, City Engr.

Brantford, Ont.—For construction of a storm sewer in Port St., city council passed a by-law. T. Harry Jones, City Engineer.

Sandwich, Ont.—Construction of a sewer at \$23,122 and water main at \$20,457 contemplated by town council. E. K. North, Town Clerk.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Chicago, Ill.—The pipe sewer, with brick manholes and brick catch-basin, in the alley first east of Wentworth Ave. from the alley first south of West Garfield boulevard to a point 380 feet north of West 57th St. *Angelo Santucci.

Chicago, Ill.—*George Pontarelli—Tile pipe sewer, with brick manholes and brick catch-basins, in a system of streets as follows: WEST 71ST STREET from South Kedzie Ave. to South Sacramento Ave., and each of the streets, to wit: South Troy St., South Albany Ave., and South Whipple St., from West 71st St. to West 73rd St.

Chicago, Ill.—Tile pipe sewer, with brick manholes, taking up old sewer and reconnecting existing drains and catch-basin connections, in Winona St., from Broadway to a point 200 feet east of Glenwood Ave. *Michael Pontarelli.

Chicago, Ill.—*George Pontarelli for brick and tile pipe sewer, with brick manholes and brick catch-basins, in a system of streets as follows: West 73rd St. from South Rockwell St. to South Sacramento Ave., and each of the streets, to wit: South Talman Ave., South Washtenaw Ave., South Fairfield Ave., and South California Ave., from West 71st St. to West 73rd St.

Indianapolis, Ind.—Board of public works let the following contracts: Local sewer in Arsenal Ave. from 28th to 30th, to *Columbia Construction Co.; local sewer in Lambert St. and Blaine Ave. from Harding to 16 ft. south of Howard to *Sheehan Construction Co.

Indianapolis, Ind.—See "Streets and Roads."

Mishawaka, Ind.—For building a sewer on 9th St. west of Spring St. to the *National Company, of South Bend. Reesh & Carter also submitted a bid.

Winchester, Ind.—Engineer A. B. Purdy of Randolph county let the contract for a public drain to O. E. Kennedy of Carlos, Ind., for \$780.10.

Fayette, Ia.—For the construction of a sewer and a sewage disposal plant, *Comstock & Hanson, for the construction of the sewer at \$18,211.10 and to *Oliver G. Kringle for the construction of the disposal plant at \$3,650.

Ludlow, Ky.—For 500 ft. 8-in. tile sewer in Carneal St. from Walnut alley to a point 75 ft. south. *Elmer Browning. W. B. Cullen, City Clerk.

Monroe, La.—*Mr. Fred Meyer for the construction of a concrete drainage box 2 ft. by 4 ft. on the north side of De Siard St., from 6th to 7th Sts. and under V. S. & P. switch track at 9th St.

East St. Louis, Mo.—The rebuilding of the outlet sewer pumping station, at a cost of \$2,500 and Trendley Ave. improvement to Louis Rich, for \$11,000.

Newark, N. J.—Two bids received by the Kearny board of health for the deepening and widening of Frank Creek, a natural meadow stream that conveys a large part of the sewage of the East Arlington section into the Passaic River. *James J. Dunn, of Kearny, \$1,066, and *Jesse Manahan, of Red Bank, \$1,066.24.

Rochester, N. Y.—*Ernest T. Kuhn for a new sewer in Highland Ave. for \$3,912.30.

Tiffin, O.—For 2,000 lin. ft. sewer in N. Sandusky St., *Geo. Stewart, at \$5,867. Bd. of Pub. Service, Wm. Heller, Dir.

Shaker Heights, O.—*S. A. Haddad, 640 Bradley St., Cleveland, O., secured

contract for storm and sanitary sewers in Warwick road and Moreland Blvd. B. W. Willard, Engr., 804 Marshall Bldg., Cleveland.

Winton, Pa.—D. Lawler, Olyphant, secured contract let by Borough for sanitary sewer; \$4,580.

Charleston, S. C.—Contracts for the laying of drains and sewers in the Boulevard area have been awarded to the Simons-Mayrant Company and for sidewalks to the Charleston Engineering and Contracting Company.

Lockhart, Tex.—Murphy Construction Company of Texarkana for the construction of a sewer system, \$30,400. Eleven miles of sewer pipe.

Seymour, Tex.—James Contracting Co., Guthrie, Okla., \$24,500 sewer system and disposal plant.

Ogden, Utah.—Bids for the construction of a storm sewer in Madison Ave. were opened and canvassed. Pending the tabulation of the bids by the city engineer, the amount asked by the lowest bidder will not be given out, but it was announced that the firm of Griffins & Reed, of Salt Lake City, seemed to have submitted the lowest bid and P. J. Moran, of Salt Lake, the second lowest bid.

Spokane, Wash.—Two sewer contracts awarded by the City Council. Thirty-first avenue job, Dixon & Oliver for \$4,419, the estimate being \$5,000. J. W. Hastings the Twenty-ninth Ave., at \$3,400, \$450 below the estimate of \$3,850.

Toronto, Ont.—Hamilton & Toronto Sewer Pipe Co., Hamilton, by board of control for annual supply of sewer pipe and for sewer brick *Dominion Sewer Pipe Co.

WATER SUPPLY

Eagle Rock, Cal.—Election for \$75,000 water works bonds was successful.

Danbury, Conn.—The Supt. of Water Works was instructed to construct a new 8-in. iron water main through Bates Pl. to connect with a pipe of the New York, New Haven & Hartford R. Co. on the property of the company south of that street.

Trinidad, Colo.—\$28,000 water works improvement bonds have been sold. Address Mayor Taylor.

Washington, D. C.—Conduit Road Citizens' Association adopted resolution calling for better police and fire service; also water pressure was recommended by C. J. Egan in a special report. Resolution also adopted for an automobile apparatus for the Georgetown station.

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—The water supply department of a city in Russia desires to purchase cast iron and steel supplies for the municipal water works, such as pipes, tubes, taps, valves, etc. Quotations should be made c. i. f. Vladivostok, preferably in Russian currency. Correspondence may be in English. Refer to Opportunity No. 23230.

Tarpon Springs, Fla.—The following bonds will be issued in near future: Water works, \$15,000; sewer, \$15,000; street and parkway improvements, \$7,500.

Roxbury, Ida.—City plans water pipe line from Moody Creek to Roxbury. P. O. Thompson, Supt.

Peoria (Averyville), Ill.—First steps toward providing Reservoir Heights with an \$18,000 water works system are expected to be taken at the meeting of the village board of Averyville. Address Village Clerk.

Middlebury, Ind.—Citizens will vote on water works.

Montezuma, Ia.—The council has undertaken preliminary steps leading to the installation of a new and substantial water tank.

Ossian, Ia.—Town will vote on installation of water works.

Murray, Ky.—An ordinance providing for the issue of bonds of the city for the purpose of constructing, operating and maintaining a municipal electric light and power plant and to improve on the present system of water works was drawn and published. The bonds will be issued in the sum of \$20,000 in the denomination of \$500.

Honma, La.—City voted bonds to install water works system. L. A. Tucker, Supt.

Skowhegan, Me.—A new water system is considered by taxpayers.

Baltimore, Md.—The Maryland House of Correction is to have a new water supply, as well as being equipped with the most sanitary arrangements for the prisoners. At a meeting held at the in-

stitution it was decided to spend from \$40,000 to \$45,000 in putting in the new plant.

Salisbury, Md.—Extensions and improvements to waterworks contemplated. E. J. C. Parsons, Pres. Council.

Gloucester, Mass.—Water Works system is considered by city. J. W. Moran, Supt.

Lowell, Mass.—City plans 8-in. water main in Stedman, Lafayette and Bernlee Sts. R. J. Thomas, Supt.

Alma, Mich.—The proposition to bond for \$60,000 for water works and new mains will come up again in the near future.

Detroit, Mich.—Water Board Engineer Theodore A. Leisen is working out the preparatory details of a mammoth filtration plant for the city, to have a capacity of 320,000,000 gallons of water a day at the outset, while the final capacity probably will reach 350,000,000 to 380,000,000 gallons; estimated cost \$4,000,000.

Pontiac, Mich.—City will vote Jan. 27 on \$275,000 water bonds.

Crookston, Minn.—Application has been made for franchise and contract for water and electric current by the Crookston Water Works & Light Co.

Goodhue, Minn.—Water works bonds of \$4,000 will be sold Dec. 19, 8 p. m., interest 5 per cent., 5, 10 and 15 years; check \$500. O. E. Kylo, Village Clerk.

Stanberry, Mo.—Contract soon to be let for about 5 miles waterworks extensions. C. A. Greenlee, City Clk.

Burlington, N. J.—An ordinance authorizing bond issue amounting to \$20,000 to refund water bonds that had lately become due, was passed by a unanimous vote.

Rockaway, N. J.—Water refunding \$25,000 bond issue is considered by borough council.

Albany, N. Y.—Conservation Commissioner George D. Pratt, Attorney General Egbert E. Woodbury and State Engineer Frank M. Williams, the Commission on River Regulation, heard the application of the Chamber of Commerce of Glens Falls for the formation of the Upper Hudson River regulating district, with the object of constructing two great storage reservoirs in the Adirondacks and thereby regulating the flow of the Hudson River. Their cost would be more than \$6,500,000, which must be paid for by the localities and municipalities benefited. Under the application, it is proposed to construct a dam at Conklingville on the Sacandaga River that would form a lake 42 square miles in area. This reservoir would contain 29,000,000,000 cu. ft. of water. The second reservoir project is for a dam on the Schroon River at Tumblehead Falls, which would back up the water on the river and on Schroon, Brandt and Paradox lakes at a height varying from 20 to 30 ft. The lake that would be formed would be 24½ square miles in area and would contain 16,000,000,000 cu. ft. of water. The Sacandaga project, although the most expensive, its estimated cost being \$4,661,000, is considered the most feasible.

Canton, N. Y.—Election carried J. & J. water supply \$180,000 bonds. H. M. Barber, Village Clerk.

Phelps, N. Y.—Water system bonds have been sold.

Minot, N. D.—City commission accepted plans and specifications for a reinforced concrete reservoir to be located on the south hill near the present steel tank, with pump house, having connections with city mains and with the present steel tank.

Bradford, O.—Engineer A. Elliott, Kimberly, 1031 Columbus Savings & Trust Bldg., Columbus, is preparing plans for a water system. The specifications include a pump, pump house, cast iron pipe mains, 1 power pump, one 50 HP. gas or kerosene engine. Address L. E. Harvey, Clerk.

Kendall, Okla.—To install waterworks city plans to vote on \$45,000 bonds.

Altoona, Pa.—Pumping station and a filtration plant are being discussed by city officials.

Clover, S. C.—City voted \$30,000 bonds for water works.

Wellington, Tex.—The attorney general's department has approved an issue of \$27,000 city of Wellington water works bonds. And issue of \$7,500 Wharton County road district bonds of Dist. No. 2.

Aberdeen, Wash.—A "Silver Spray" sprinkler system that will water an entire block at one time will be installed in 7 blocks of parking strip which occupy center of Market St.

Tacoma, Wash.—Commissioner Gronen was authorized by the council to purchase four Ford automobiles, two of them to be trucks, for the light and water departments.

Seattle, Wash.—Plans approved: 44th Ave., S. W., et al., water mains; 25th Ave., S., Holgate to Bayview, water mains; estimated cost, \$3,450.

Green Bay, Wis.—An election in the near future to issue water system extension bonds \$35,000.

New Richmond, Wis.—City plans bond issue to build water works. E. Halverston, Supt.

Winnipeg, Man.—See "Sewerage."

Hamilton, Ont.—Proposition to build a reservoir was defeated by city council at an estimated cost of \$428,250.

Chicoutimi, Que.—Water works system for Pitre Laberge, to include about 11 miles of Columbia pine pipes. Work will start in the spring. J. A. Clearean, Engineer.

St. Marc des Carrières, Que.—At an estimated cost of \$15,000, Octane Naud proposes to construct a water works system; will require wood or cast iron pipe.

Trall, B. C.—Engineer McCulloch, of Nelson, B. C., will prepare estimates on a better water supply and a sewer system for the city.

Dartmouth, N. S.—The water and sewerage systems, at cost of \$6,800, are to be extended.

BIDS RECEIVED AND CONTRACTS AWARDED.

(* Indicates Contracts Awarded.)

Plant City, Fla.—Board of public works accepted bid of *H. O. Hobbs on construction of the proposed new water works, the building and concrete pit, complete, for \$4,904.71.

Lawrence, Mass.—For the purchase of 60 tons of cast iron water pipe for the water department. *Donaldson Iron Co., Emaus, Pa., \$38.50 per ton. Other bids received: U. S. Cast Iron Pipe Co., Philadelphia, \$41.25; Warren Foundry & Machine Co., Phillipsburg, N. J., \$39.84; Standard Pipe & Foundry Co., \$40.75; R. D. Wood & Co., Philadelphia, \$40.75; Donaldson Iron Co., Emaus, Pa., \$38.50.

Minot, N. D.—City commission to *Swenson Artesian Drill Co., at \$8.50 per lin. ft. for a 10-in. test well.

MISCELLANEOUS.

Porterville, Cal.—City may make another attempt to form a levee district, in order to construct an \$8,000 jetty and to deepen the channel of the Tule River to prevent occasional floods from inundating the lowest part of the city. A like attempt three years ago failed, because the ranchers did not want to take part, on the ground that the flood enriched the land.

San Jose, Cal.—For the construction of the Foxworthy drainage ditch, also construction of a reinforced concrete culvert on Plummer avenue to the *Raisch Improvement Company for the sum of \$11,790.

Bridgeport, Conn.—Mayor Clifford B. Wilson's message to council recommends purchase of Steeplechase Island as an amusement resort for the general public. Also that the city build a comfort station on Catherine St.

Bridgeport, Conn.—See "Streets and Roads."

Stamford, Conn.—City Engr. Nash is asking for an appropriation to purchase a small motor truck for use in his department.

Washington, D. C.—Congress has authorized a total expenditure of \$1,300,000 for land to connect Zoological Park and Potomac Park, in order to carry out the project of opening up Rock Creek Valley for the beautifying of city, and has made an appropriation of \$50,000 to get the work under way.

Washington, D. C.—Recommendations of commissioners for 1917: A municipal hospital, cost \$500,000; the purchase of the Dean and Patterson tracts and a strip of Klinge Valley for park purpose; the sum of \$350,000 for the Anacostia River reclamation project; \$200,000 again toward the construction of a \$600,000 garbage disposal plant near Blue Plains, Md.; also recommends all overhead wires put underground.

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—A man in Spain would like to be placed in communication with American manufacturers and exporters of dynamos, electric motors, electric lamps,

electric wires, and all kinds of electrical materials. Quotations should be made e. i. f. destination. Payment will be made against shipping documents. Correspondence in Spanish. Reference. Refer to opportunity No. 23229.

Indianapolis, Ind.—The superintendent of sweeping and sprinkling, 1134 Shelby St., is contemplating the purchase of new street sweepers for the city.

Indianapolis, Ind.—An ordinance authorizing a bond issue of \$116,460 for flood prevention.

Kokomo, Ind.—Bids are asked for three garbage wagons.

Lexington, Ky.—A costly subway, to eliminate the grade crossing on the Versailles Pike at the end of West High St., is being promoted, and tentative plans are now being prepared by the City Engineering Dept. and the engineering corps of the Southern Railway. According to the plans the proposed subway will be about 1,200 ft. long. It is likely the walls of the tunnel will be constructed of concrete.

Lake Charles, La.—An election will be held Dec. 27 to issue \$260,000 Intra-Costal Canal Improvement bonds.

Boston, Mass.—The State Public Service Commission has issued an order authorizing the Bay State Street Railway Co. to issue serial coupon notes amounting to \$2,500,000 for the purpose of reconstructing track overhead equipment and for replacing rolling stock.

Waltham, Mass.—An order was presented for \$3,350 for construction of a drain in West Dale street. Referred to the Public Works.

Ann Arbor, Mich.—Common Council has instructed City Engineer Manley Osgood to prepare general plans and specifications for garbage disposal plant for the city.

Minneapolis, Minn.—Sale of \$50,000 worth of bonds to aid in the acquisition of a 92-acre addition to Glenwood park was urged upon the ways and means committee of the city council by members of the board of park commissioners.

Two Harbors, Minn.—City council accepted plans and specifications for the construction of a municipal ice-house. Building will be 60 by 80 ft., will hold 2,500 tons of ice and will cost about \$1,800.

Atlantic Highlands, N. J.—An election will be held Dec. 29 to vote \$20,000 public park bonds.

Auburn, N. Y.—Bonds will be issued by the Common Council for the sum of \$3,870.67 to cover the cost of flushing the paved streets.

Oswego, N. Y.—City Engineer J. H. Flannigan presented a report that plans were being prepared for the proposed subway at E. 9th and Schuyler Sts.

Rochester, N. Y.—Comnr. of Parks A. B. Lamberton expects to ask for an appropriation of \$250,000 for the operation of the parks, next year, and it is said

that the Bureau of Playgrounds and Recreation will ask for \$100,000.

Schenectady, N. Y.—The annual report of G. B. Sisson, deputy commissioner of public works, which was filed with Commissioner of Public Works Hunt, urges the erection of a municipal building for the city.

Utica, N. Y.—City Clerk J. Phil Banigan in his annual report submitted to Mayor James D. Smith, recommended need of a new city hall to supply working accommodations for city employees and safe places for filing city records and the necessity for codifying the city charter.

Harrisburg, Pa.—Plans for a municipal bathhouse are under consideration by Commissioner Gross, who will ask for an appropriation of at least \$5,000 to carry out the work of equipping bathhouses and building a bathhouse and bathing beach on Hargest island.

Newport News, Va.—City contemplates constructing garbage disposal plants on East End and North End; estimated cost \$13,000. T. E. Pearce, City Engr.

Norfolk, Va.—City bonds sold to R. M. Grant & Co., of New York; bid, 99.17; the face value of the bonds was \$582,000.

Bellingham, Wash.—Plans are being prepared by Archt. T. F. Doan for the construction of the proposed ocean dock along Whatcom creek at Pine St. to be erected by the city at a cost of \$25,000.

Tacoma, Wash.—The county has appropriated \$30,000 in next year's budget for a ferry and docks between Tacoma and Vashon Island points, and enough of this sum will be used to build a new and modern wharf at Old Town inside the breakwater for the Tacoma terminal.

Guelph, Ont.—The Wellington County Council may purchase road oil in large quantities. County Road Supt., John Young, Harrison, Ont.

Niagara Falls, Ont.—Council granted the request of the Glenview Improvement Club to erect street signs and install a catch basin on Staunton Ave.

Ottawa, Ont.—The proposal of Mayor Porter to enlarge the city hall was endorsed by board of control.

BIDS RECEIVED AND CONTRACTS AWARDED.

(* Indicates Contracts Awarded.)

Fitchburg, Mass.—The board of health voted to award the contract for collection of house offal to *Carnes P. Corliss, 28 Winter St., for \$2,900 a year.

Grand Rapids, Mich.—Plans to motorize the garbage department have been delayed until March, 1917, and the board of health has tentatively accepted the bid of the United Motor Truck Co. for a truck to cost \$3,500. It was the only bid entered under the specifications. Delay in the motorization proposed is

caused by new plans the board of public works is formulating for sewage disposal. Should those plans mature a fleet of motor trucks will be necessary. The city engineer's department is said to be working on plans calling for the installation of screens at the mouth of the sewers emptying into Grand River. These screens separate the solids from the fluids and the matter then can be hauled to an isolated spot and buried. It is believed this plan will meet with the approval of Wyoming township, will satisfy the Supreme Court and save the expenditure of the huge sum necessary for the installation of sewage disposal plants.

Rochester, N. Y.—The contract for building revolving doors on the Fitzhugh Street entrance at the City Hall was let to *Fred Gleason for \$375. *The Monroe Painting Company for cleaning and painting the iron fence at Exposition Park for \$770.55.

Lima, O.—Improvement of the Ottawa river from Main street to the Erie bridge John H. Jones, Fostoria, \$57,857.50.

Wilkes-Barre, Pa.—City councilmen have agreed that the contract for the collecting and disposal of garbage will be awarded to the Wilkes-Barre Disposal Co. The duration of the contract will probably be for ten years, inasmuch as this reduces the rate. The method of disposal will be through the pig farm that the company will establish. Before any contract is entered into the State's approval of the plans must be obtained. The matter is to be presented at once to the state department of health, and it is believed that within a short time action will be taken.

Wilkes-Barre, Pa.—City council opened bids for the collection and disposal of garbage. Wilkes-Barre Disposal Co. submitted two bids. On the first plan they agreed to collect garbage and dispose of it by establishing a pig farm. On the 5-year contract they asked for \$19,500 annually. On the 7-year contract they asked for \$19,000 annually. On the 10-year contract they asked for \$18,500. Second bid of this company was on the incineration plan. They asked \$28,000 annually on a 5-year contract; \$25,000 annually on a 7-year contract; \$22,500 annually on a 10-year contract. Harvey Houck agreed to establish a pig farm and his bid was: 5-year contract, \$19,670 annually; 7-year contract, \$19,044 annually; 10-year contract, \$18,794 annually. Joseph Shovlin bid only on a reduction method: 5-year contract, \$34,800 annually; 7-year contract, \$32,800 annually; 10-year contract, \$27,800 annually. Council referred the bids to a committee of the whole and will award the contract at a later date.

Norfolk, Va.—The board of control awarded the following contract: To *A. Wrenn & Sons, Inc., to furnish the street cleaning department with saddle pads, straps, etc.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREETS AND ROADS.				
Wash., Seattle	.....10 a.m., Dec. 15..	Paving with brick and constructing concrete curb.....	Board of Public Works.	
Wash., Spokane	.....Dec. 21..	Constructing curbs on Linto Avenue.....	City Engineer.	
Ind., Lebanon	.....10 a.m., Jan. 2..	Constructing county road.....	Cleve Goodwin, Co. Aud.	
SEWERAGE.				
Pa., Allentown	.....1 p.m., Dec. 26..	Constructing storm water sewers; 9,600 feet 15-inch to 100-inch.....	C. D. Weirbach, City Engr.	
WATER SUPPLY.				
Wash., Everett	.....Dec. 18..	Pumping plant for proposed sanitarium.....	Mae Weatherbee, Co. Aud.	
Mass., Boston	.....noon, Dec. 19..	Five hundred meter boxes, hydrants, frames and iron castings in general.....	Patrick O'Hearn, Acting Supt. of Supplies.	
Conn., Waterbury	.....8 p.m., Dec. 19..	Driving tunnel and constructing dam at reservoir No. 3...	R. A. Cairns, City Engr.	
D. C., Washington	.....Dec. 20..	Wrought iron or steel pipe, valves, etc.....	Genl. Purchasing Officer, Panama Canal.	
Ia., Webster City	.....Jan. 8..	Improving and extending water system.....	City Clerk.	
MISCELLANEOUS.				
N. Y., New York	.....11 a.m., Dec. 22..	Two gasoline motor trucks.....	Supt. of School Supplies, Park Ave. and 59th St.	
Ind., Lebanon	.....2 p.m., Dec. 28..	Constructing drainage ditch.....	D. J. West, Trustee, Marion Township.	

STREETS AND ROADS

Birmingham, Ala.—Ordinance to provide for certain improvements on 26th St., south, from Sixth Ave., south, to Eighth Ave., south, and on First Ave. from a point 95 ft. west of 62d St. westward to a point 154.5 ft. west of 62d St.

Winter Haven, Fla.—County commissioners have been petitioned to create a special road and bridge district for the Winter Haven section to build 50 miles of sheet asphalt road: \$325,000 bond issue may be voted in January.

Atlanta, Ga.—County Commissioner W. Tom Winn and President Arkwright of the Georgia Railway & Power Co., the county commissioners passed a resolution providing for a new asphalt pavement on Peachtree road from the city limits to Buckhead, to be laid next spring.

Atlanta, Ga.—The paving with asphalt of one block of Berne St. and one block of South Blvd., facing Grant Park, in the Third Ward, will be provided for in a resolution to be presented the council. The county commissioners have agreed to furnish the labor and material for the work.

Chicago (Austin), Ill.—Chicago half of Austin Ave. to be made a boulevard, under control of the West Park Board.

Braidwood, Ill.—Braidwood Burlington Way Association Co. operates with township highway commissioners for hard road in that section of the Burlington Way. Will H. Smith, county superintendent of highways, surveyed the work and will prepare all data for the letting of a contract, which will take place as soon as possible.

Huntington, Ind.—Board of commissioners ordered the auditor to advertise for bids for the construction of the Beardsley Rittenhouse road in Rock Creek township.

Monticello, Ind.—White county commissioners failed to award contract for the Prairie township road, advertised for December letting.

Fort Wayne, Ind.—Property owners will be asked to sign a petition in the near future calling for a greater width of the street.

Wichita, Kan.—Ordinance authorizing the repaving of the intersection of Fountain Ave. and First St., and directing the city engineer to do this work.

Lake Charles, La.—The police jury authorized President H. G. Chalkley to advertise for gravel to be supplied for the new parish roads. In asking for bids the gravel pits will be requested to state how much gravel a day they can furnish.

Nashville, Mich.—Bonding the village for paving Main St., the vote carried. Paving will extend from the town hall to the Quaker Brook bridge.

Minneapolis, Minn.—Resolutions passed by city council ordering improvements of following streets: 40th St., east, and existing streets from Chicago Ave. to Park Ave.; Bloomington Ave. from East 40th St. to East 42d St.; Garfield Ave. from 53d St. to 54th St.; Harriet Ave. from 44th St. to 45th St.; Newton Ave., south, from 51st St. to 52d St.; Harriet Ave. from 53d St. to 54th St.; 43d St., west, from Xerxes Ave., south, to Drew Ave., south.

Minneapolis, Minn.—Extension of a 30-ft. creosote block pavement in North Minneapolis from 42d St. and Lyndale Ave., north, to the city limits, will be recommended to the council by the committee on paving. Paving will extend along Washington Ave., from 42d to 44th St., then along 44th St. to the Osseo road and along the Osseo road to the city limits.

St. Paul, Minn.—All bids received for the grading of Bellevue Ave. from West Seventh St. to Stewart, Munster St. from West Seventh St. to Davenport Ave., Graham St. from West Seventh St. to Davenport Ave. and Davenport Ave. from West Seventh St. to Stewart Ave., rejected, to readvertise.

St. Paul, Minn.—Bids for grading of alley in Scotten's Sub. of block 71. Lyman Dayton's addition, rejected; to re-advertise.

St. Louis, Mo.—Approval of an appropriation of \$50,000 for completing the improvement of Florissant Ave., from Bernays to Carrie Ave., has been given by the board of estimate and apportionment, and the work will be done by the city and charged to the contractor, G. A. Heman, who has delayed the work.

Grand Island, Neb.—Mayor cancelled Division St. paving contract and suggested new bids advertised.

Gouverneur, N. Y.—J. C. Finch, chairman of the good roads committee of the Gouverneur Chamber of Commerce, and

others attended the hearing of the good roads committee of the county board of supervisors held at Canton and presented a petition asking that the \$3,400 received by the county treasurer as the percentage of automobile licence money allotted to the counties of the state for construction and maintenance of improved highways be given over to towns that had not been fortunate enough to secure aid from the state in the construction of highways. It was decided that their plan was the best and that the town of Colton should be given this year's money to improve the Seavey highway and that next year the town of Pitcairn should benefit from this fund.

Schenectady, N. Y.—A petition for the improvement as a county highway of the so-called "River road," from Yelverton's corners, Glenville, through the village of Alplaus to the county line at Rexford, will be presented for signatures at the meeting of the Alplaus Civic Improvement Association.

Wampsville, N. Y.—Petitions were presented from the town boards of Cazenovia, Lenox and Nelson, asking that certain highways be placed on the map as county roads, and designated for improvement next summer, were granted. In Cazenovia the road runs from New Woodstock to Timmon's Corners, a distance of 3 1/4 miles, and from the county line on the Gridley road to the county road already built. Lenox, the strip from the present county road on North Mall St., Canastota, to Oneida Lake completed. The distance is 2 1/2 miles, and Whitelaw-Nelson, a strip of the Erieville-Nelson road improved 1 1/4 miles in length.

Oyster Bay, L. I., N. Y.—Town board and the superintendent of highways have made the various apportionments for the expenditure of town moneys for the improvements to the town highways and have set aside by agreement the average sum of \$100 per mile for 150 miles which is the total mileage within the town limits. One thousand dollars for the repair and construction of bridges, culverts, sluices, etc. Certain sums for the permanent improvement of highways totaling \$35,965 in special appropriation.

Maricetta, O.—Providing the state allows Washington county \$30,000 out of the funds available for the improvement of the main market roads, the county commissioners voted a resolution by which they will add an additional \$30,000 to the state appropriation.

Milan, O.—Double curve to be straightened entering Milan from the west. A movement is said to be under way to eliminate the grade crossing on this hill. Under the proposed plan which village authorities are working a viaduct will be constructed over the low land that will be of sufficient height to clear the railroad, eliminating the present dangerous grade crossing.

Oklahoma, Okla.—Charter for a 27-mile asphalt hard road in the Healdton oil field was granted here by Secretary of State J. L. Lyon to a number of oil men in the southern field. The company is capitalized at \$400,000.

Phoenixville, Pa.—Buttonwood St. will be graded between Fourth and Fifth Aves. The street committee will receive bids for the work.

Beresford, S. D.—Mayor Steensland and others have recently been investigating the paving proposition and a movement may be inaugurated to do a great deal of street paving during the coming year.

Dallas, Tex.—Fifth St. will be paved from the Jimtown road to Tenth St., and concrete. Montreal St. is to be surfaced with natural lake asphaltic concrete from the Jimroad road to Tenth St., and on Tenth St. between Montreal and Jefferson Ave.

Texarkana-Arkansas, Tex.—Effort is to be made by County Commissioner Akin of Precinct 1, Bowie county, to repair and maintain the system of turnpikes.

Suffolk, Va.—Nansemond county board of supervisors, the county officials were petitioned by a number of representative citizens of the county to ask for federal aid in the proposed highway from Norfolk to Richmond.

Bluefield, W. Va.—By consent of the council it was ordered that the sidewalks on Walton Ave. be made 5 ft. in width.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Fort Myers, Fla.—J. B. McCrary Co. of Atlanta, Ga., contract to clear and

grade the road from Marco to the Dade county line, in what is known as Road and Bridge District No. 3, by the county commissioners, at \$111,800.

Coal City, Ill.—The highway commissioners of Braceville township, Stanley Planette, Coal City, town clerk, for the paving of a half mile of road between here and Braceville, at 83 cts. per cu. yd., and to grade and scrape the road, besides hauling out the stone.

Kokomo, Ind.—For the Joseph W. Clark road, let by the county commissioners to J. H. Watson & Co., at \$11,771. Other bidder: Fred Davenport, at \$12,250.

Newport, Ind.—For the Helt township gravel road, Vermillion county, to Chas. W. Clark, of Clinton, Ind., \$2,849.

Hamilton, O.—The county commissioners received estimates for the cost of the Dixie highway through Hamilton on the Carthage-Hamilton route as follows: Distance, 5.97 miles; brick, \$124,490.66; water bound macadam, \$56,531.54. For a strip on the Hamilton and scipio pike, 1.44 mile: Brick, \$41,576.52; water bound macadam, \$21,719. For 3.08 miles on the Hamilton and Middletown pike: Brick, \$69,743; water bound macadam, \$36,385. For 3.54 miles on Middletown and Franklin pike: Brick, \$77,600; water bound macadam, \$40,000. The contracts will be awarded Dec. 21.

Ironton, O.—Jess Dillon, the road contractor, the contest for grading 13 miles of road in Greenup county. The contract calls for five miles from Russell extending toward Greenup, and eight miles beginning at the county line opposite Portsmouth and extending up the river towards Portsmouth.

Greenville, S. C.—The contract between the city and Slattery & Henry, contractors, for street paving on Hampton Ave. and Augusta St., has been duly drawn up and approved by the city council.

Dallas, Tex.—Mayor and board of city commissioners, Otto H. Lang, street commissioner, awarded paving as follows: Woodlawn Ave. from Canty to Concho, to *Western Paving Co., Oklahoma City, Okla., for \$4,900.56, the city's part of which is \$64.75; on 12th St., between Lancaster and Tyler, *Standard Engineering & Construction Co., Dallas, Tex., for \$56,469.50 for Uvalde asphalt rock, city's portion \$520; on Harrison Ave., from Grand to the Sante Fe Railroad tracks, *Standard Engineering & Construction Co., Dallas, Tex., for \$11,333.16, the city's part being \$144.31, and on Hibernia, between Routh and Worthington St., *Vibrolithic Construction Co., for \$8,875.44, the city's part being \$15.56; \$1,030 by the *J. F. Ketchey Co. was the lowest for the construction of curbs and walks on Sanger Ave., from Ervay to St. Louis.

Portsmouth, Va.—Norfolk county bonding commission decided to authorize the *Lawson Construction Co. to continue with the work of building certain concrete roads in Tanner's Creek and Washington districts.

Bluefield, W. Va.—*R. F. Baker for the resurfacing of East Princeton Ave., 95 cts. per sq. yd. The entire cost will be about \$9,500. The contract calls for Bermuda asphalt binder.

SEWERAGE

Grosse Pointe, Mich.—Belated report from Grosse Pointe filed at the county clerk's office shows the bond issue of \$181,426 for a sanitary sewerage system and disposal plant, voted on at a special election July 27, of the present year, was passed.

St. Louis, Mo.—See "Miscellaneous."
Rochester, N. Y.—Council committee may advise issue of \$1,800,000 in bonds. The issues of notes to be replaced by bonds include \$500,000 local improvement notes, \$300,000 in school construction, \$685,000 water works improvement and \$350,000 sewage disposal notes.

Middletown, O.—Harrison T. Eddy, sewer engineer of the firm of Metcalf & Eddy, Boston, Mass., will present a proposition for drawing plans for a new general sewerage system for the city and also make an offer as to what he will charge to be retained as consulting engineer to work in conjunction with Engineer Morrison. Engineer sees no necessity for considering the double sewerage system, as in most instances the combination system of storm and sanitary sewer will prove all right.

Monaca, Pa.—Council instructed the secretary to advertise for bids for the laying of a sewer in Pacific Ave., Fisher alley and Sixth St. The bids are to be in the hands of the sewer committee and borough engineer in ten days.

Bluefield, W. Va.—By request of a resident the sanitary sewer on Boone St. was ordered extended.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Sacramento, Cal.—For three alleys between Second Ave. and Third Ave., in West Curtis Oaks, in the city, be improved by constructing 8-in. vitrified ironstone pipe sewer from the northerly line of Third Ave. to a point 7 ft. northerly from the southerly line of Second Ave., to *Joe Lawrence.

Sacramento, Cal.—Alley first south of Fourth Ave., in West Curtis Oaks, in the city, be improved by excavating a trench and constructing an 8-in. vitrified ironstone pipe sewer from the manhole in place on Fourth Ave. near the round curb corner of Lot No. 203, southerly to the angle point easterly to a point 56.6 ft. westerly from the westerly line of 24th St.; constructing 5 concrete manholes complete with cast iron curbs and covers; placing 33 6-in. vitrified ironstone dye branches on 8-in. pipe sewer, and backfilling the trench, to *Joe Lawrence.

Boston, Mass.—Pipe sewers and drains, Estella St., from Morton St. about 270 ft. westerly, Dorchester, bids opened Nov. 24: *George J. Regan, \$406. Other bidders: Timothy Coughlin, \$419.75; Anthony Baruffaldi, \$485.25; Frank Drinkwater, \$593.75; Daddario & Booth, \$620.25; John Guarino & Son, \$651.45; H. H. Loonie, \$686.50; V. Grande, \$807. Engineer's estimate, \$615.25.

St. Paul, Minn.—For the construction of a sewer on Morton St., between Seminole St. and Ohio St., to *E. T. Webster, 437 Beacon St., at \$890. Engineer's estimate, \$867.

St. Paul, Minn.—Contract for the construction of a sewer on Harvester Ave.

from White Bear Ave. to Van Dyke Ave. to *Christ Johnson, St. Paul, Minn., at \$1,074.50. Engineer's estimate, \$1,064.

St. Paul, Minn.—For the construction of a sewer on Bayard Ave. from Victoria St. to Chatsworth St., to *DeGraff Wolff for the sum of \$5,090. Engineer's estimate, \$5,659.

St. Paul, Minn.—Contract for the grading of Keller St. from Phalen Ave. to Hazelwood Ave., to *Christ Johnson, St. Paul, Minn., at \$947.60. Engineer's estimate, \$925.

Ogden, Utah.—*Gibbons & Reed, a Salt Lake firm, for the construction of a storm sewer in Madison Ave. from 25th St. to Ogden River, \$23,607.25, and the company agrees to complete the work in 145 days.

Fort Flagler, Wash.—For the installation of sewer, *H. A. Cotton, of Point Townsend, at \$5,750. Pearson Construction Co., Seattle, bid \$7,726, \$8,342 and \$6,860.

WATER SUPPLY

Plant City, Fla.—City plans \$15,000 for the water works to be used in completing the plant and installing the new machinery recently purchased.

Matherville, Ill.—A water tank on a 100 ft. steel tower is to be erected.

La Crosse, Kan.—The proposed water works system is to be put in operation.

Washington, D. C. (Bureau of Foreign and Domestic Commerce, Department of Commerce).—Two firms in Venezuela have made inquiries regarding turbine water wheels, spiral water pipe and small electric installations. Correspondence in Spanish. Refer to Opportunity No. 23236.

Pipestone, Minn.—Petition has been presented to the city council asking for extension of water mains.

Rochester, N. Y.—See "Sewerage."

Mechanicsburg, O.—The council is planning to establish a water system. Address Village Clerk.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Boston, Mass.—Water pipe, Atlantic Ave.; Causeway St., from Lancaster St.

State St., from existing main to Atlantic Ave.; Causeway St., from Lancaster St. to Haverhill St.; Portland St., from existing main to Causeway St.; Friend St., from existing main to Causeway St.; Canal St., from existing main to Causeway St.; Lancaster St., from Causeway St., 200 ft. easterly, city proper, opened Dec. 6: *Antony Cefalo, \$4,587.50. Other bidders: John Guarino & Son, \$6,150; Anthony Baruffaldi, \$6,280; V. Grande, \$6,840. Engineer's estimate, \$5,500.

Boston, Mass.—Dec. 4 the Mayor approved a contract with *James Barletta, at \$1,121.50, for laying water pipes in Dunboy and Harriet Sts. and Waldo terrace, Brighton, opened Nov. 24, were as follows: Hugh McNulty, \$1,142.65; A. Baruffaldi, \$1,167.95; John Guarino & Son, \$1,204.45; V. Grande, \$1,458.25.

Eveleth, Minn.—For laying 4,000 ft. of 16-in. water line from this city to the pumping plant at St. Mary's lake, *Lawrence-McCann Co., of this city. Others were Risberg & Marvick, Virginia; Pastoret Construction Co., of Duluth, and W. D. Lovell, of Minneapolis.

Cleveland, O.—Director T. S. Farrell and water department heads, the city board of control, the reconstruction of the clear water basin of the West Side filtration plant to the *John F. Casey Co., \$328,317.

Erie, Pa.—Water commissioners awarded contracts totalling \$80,000 for improvements and new machinery at the pumping station of the water works. *R. D. Wood & Co., of Philadelphia, for a 20,000,000-gal. low duty pump, designed for service between the pumping station and the filter plant; bid of \$14,700. Others on the pump were: The Dravo-Doyle Co., Pittsburgh, bid \$12,800, on 47 weeks' delivery, and the Worthington Pump & Machine Co., New York, proposed \$15,185 on 15 months' delivery. The earlier delivery of the Wood Co. was considered worth the difference in bids. On a bid appropriating \$40,000, the *Wood Co. also for furnishing pipe and material for the new pipe system and discharge line outside the pumping station. Delivery of material will range from two weeks to three months. The *Pitt Construction Co., Pittsburgh, for reconstructing the outside pipe line, on a bid ap-

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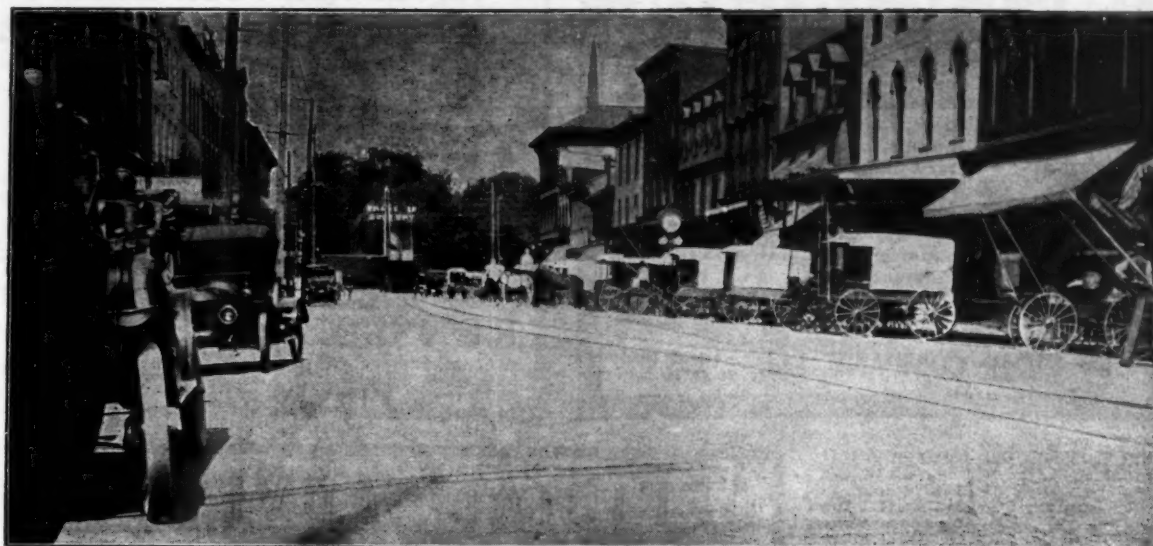
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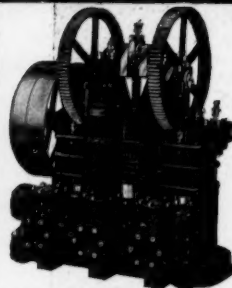
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proximating \$20,000. The plans of Engineer J. N. Chester call for relaying of the entire line from the station south in Chestnut St. to Short St., also west from the works several hundred feet. The new system is designed to give more efficient service throughout the city. The "Eddy Valve Co., Troy, N. Y., for furnishing valves, bidding \$4,500; and the "Simplex Valve Co., Philadelphia, \$1,084, for a Venturi motor.

MISCELLANEOUS.

St. Louis, Mo.—A bond issue of \$14,000,000 to meet the cost of permanent improvements was approved by Mayor's Committee. The proposition may be submitted at a special election in May or June. If the issue is voted it will give ample funds for the city plan commission's various proposals for improvement of this city. The amounts recommended to spend are for the following: River des Peres into a sewer, railroad and boulevard, \$8,500,000; belt railroad, including docks, \$2,000,000; convention hall, \$1,000,000; industrial farm, \$400,000; incinerating plant, \$250,000; viaducts at different grade crossings, \$2,000,000. Allowances made for these and other undertakings, except the improvement of River des Peres, probably will be changed before final approval by the mayor's conference is requested.

Brooklyn, N. Y.—The Public Service Commission received a petition from a large number of the civic and business organizations of Central Brooklyn urging the commission to recommend the construction of the physical connection at Ashland Pl. between the Fulton St. elevated and the existing Fourth Ave. subway; the diversion of the \$900,000 set aside for the Adams St. relocation to pay for the construction of the physical connection; and to permit the elevated structure to be third-tracked only to Cumberland St., below which point it would continue as a two-track structure, as at present. That as soon as the new facilities provided for under the dual contract between downtown Brooklyn and Manhattan are completed, there will be six subway tubes under the river and four subway tracks over the Manhattan bridge, with an aggregate one-way capacity of about 2,100 cars per hour.

Troy, N. Y.—City Engineer Roche, who is representing Mayor Burns at the National Rivers and Harbors Congress at Washington, informed the mayor that the War Department had approved the plan for the creation of a harbor at this city, and that immediately the sum of \$610,000 becomes available for the improvement.

Cleveland, O.—Sealed bids will be received at the office of the director of finance, room 226, City Hall, until 12 o'clock, noon, Jan. 8, 1917, for the purchase of \$600,000 grade crossing coupon bonds, dated Oct. 1, 1916.

Seattle, Wash.—Ordinance passed authorizing purchase of underground material, consisting of cable and conduits for the police signal system.

BIDS RECEIVED AND CONTRACTS AWARDED.

(*Indicates Contracts Awarded.)

Shoals, Ind.—Marion County commissioners contracted with the "Gallon Iron Works for a 30-ton oil road roller, to be used on the pike roads of the county. The road roller is combined with grader and scarifier attached; cost, \$2,541.

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CITY OF ALLENTOWN, PA.

Department of Streets and Public Improvements.

SEALED PROPOSALS will be received at the office of the undersigned, No. 39 North Seventh Street, up to 1:00 o'clock P. M., Tuesday, December 26th, 1916, for the construction of the following Storm Water Sewers and appurtenances:

- (1) On Tilghman Street, from 18th to 19th Street, and on 19th Street, from Tilghman to Congress Street; 3,400 lin. ft. 24-in. to 48-in. sewer. Certified check required, \$1,200; Construction Bond, \$12,000.
- (2) On Lehigh Street, from South 6th to South 9th Street; 1,330 lin. ft. 15-in. to 22-in. sewer. Certified check required, \$250; Construction Bond, \$2,500.
- (3) On Sumner Avenue, from 12th to 14th Street; 1,300 lin. ft. 7'3"x8'4" Reinforced Concrete box culvert section. Certified check required, \$1,000; Construction Bond, \$10,000.
- (4) On East Maple and East Clair Streets, from South Bradford to North Ellsworth Street; 2,670 lin. ft. 48-in. sewer. Certified check required, \$1,000; Construction Bond, \$10,000.
- (5) Oak and Howard Relief Sewer; 670 lin. ft. 36-in., and 150 ft. reconstruction work; alternate bid, 1,030 lin. ft. 36-in. sewer. Certified check required, \$250; Construction Bond, \$2,500.

The quantities named are approximate and are given only to show the relative extent of the several works. Bids will be received on sewers whose diameter is 24 inches or larger for reinforced concrete pipe, segment block or monolithic concrete.

All bids must be enclosed in sealed envelopes and indorsed: "Proposals for Storm Sewers," and as a guarantee of good faith, each bid must be accompanied by a certified check on some National Bank or Trust Company in the sums above named, made payable without restrictions to the "City of Allentown, Pa."

Plans, specifications and blank forms of proposals may be had upon application to Chas. D. Weirbach, City Engineer, upon the deposit of \$5.00, which sum will be returned upon the submission of bids and return of plans.

The City reserves the right to reject any or all bids.

A. L. REICHENBACH,
Mayor.

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